JULY 8, 1933

Railway Age

FOUNDED IN 1856

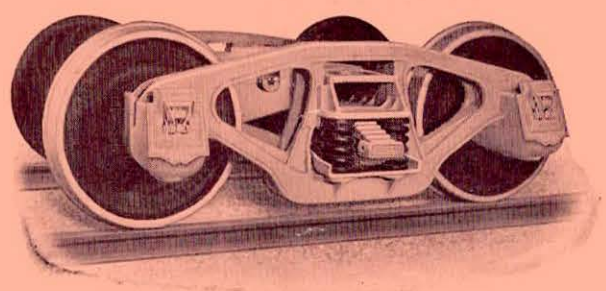
GENEVA COLLEGE LIBRARY
No.

THE IMPROVED
DOUBLE TRUSS
TRUCK

is being Applied to the

FIVE NEW STANDARD A. R. A.
STEEL SHEATHED WOOD LINED BOX CARS
A. R. A. Circular D. V. 768—Appendix-A

MINIMUM WEIGHT with MAXIMUM STRENGTH



Patented and Patents Pending

INTERCHANGES WITH
EXISTING A. R. A. STANDARDS
and
PROVIDES FOR THE APPLICATION OF THE
PREFERRED DESIGN
of
"COIL-ELLIPTIC" SPRING GROUPS

Without Change in Side Frame or Bolster

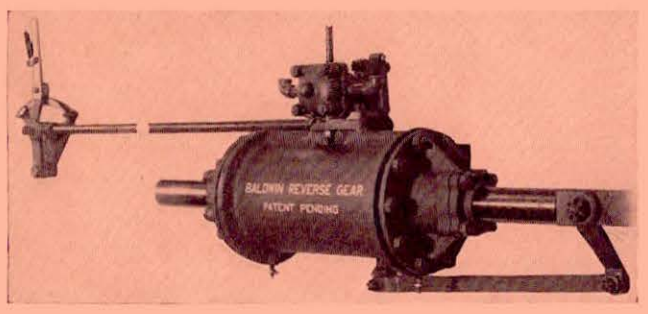
May be Purchased from the Following Licensed Manufacturers

AMERICAN STEEL FOUNDRIES
THE BETTENDORF CO.
BIRDSBORO STEEL F'DRY & MACH. CO.
THE BUCKEYE STEEL CASTINGS CO.
THE GOULD COUPLER CO.
THE OHIO STEEL FOUNDRY CO.
PITTSBURGH STEEL F'DRY CORP.
SCULLIN STEEL CO.

ADANAC SUPPLIES, Ltd., CANADA

THE SYMINGTON COMPANY

BALDWIN POWER REVERSE GEAR

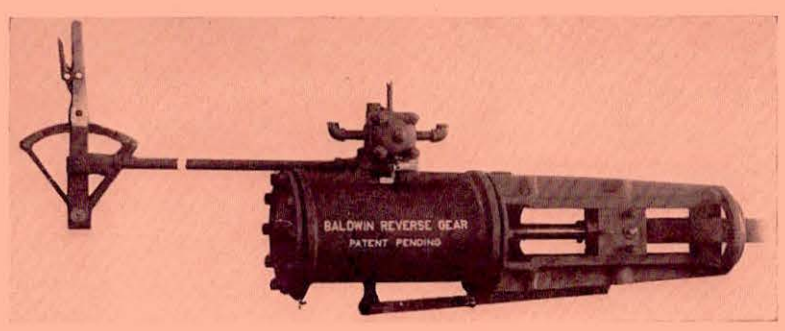


TYPE "T"

with hollow, extended piston rod—no guides or crosshead

TYPE "C"

with conventional guides and crosshead



This new gear embodies the following features giving greater dependability and lower maintenance —

(1) Rotating flat-seat valves of a new design, made from a non-corrosive alloy.

(2) Separate valve seat which can be removed with the valve for regrinding at the bench. Spare valve and seat—ground ready for service—can be quickly applied thus eliminating expensive delays.

(3) Jaw at end of piston rod of type "T" gear is removable to facilitate renewal of packing or removal of cylinder head.

(4) Piston rod packing on type "C" gear is interchangeable with packing of 11″ and 8½″ c.c. air pumps, making it unnecessary to stock a special packing for this gear.

(5) All parts machined to close tolerances — similar parts are interchangeable on all Baldwin gears.

(6) Operated by air or steam — connections separated by check valves to prevent leakage.

Baldwin gears will not creep if properly maintained.

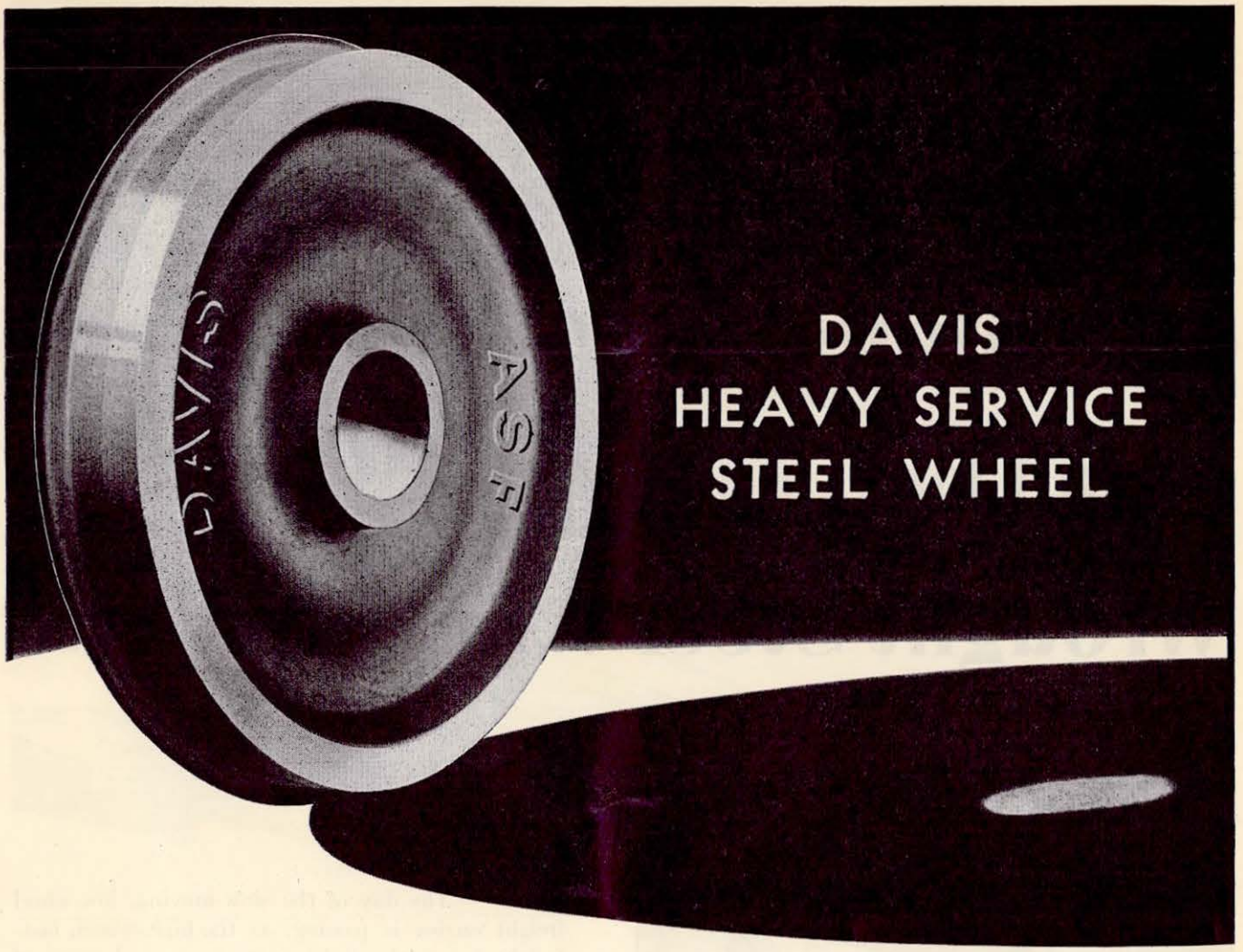
New centering device moves valve to neutral position and holds it there until new adjustment of gear is desired by the operator.

May We Not Quote On Your Reverse Gear Requirements?

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879.



A wheel made of special composition metal and heat treated to produce a hard, tough, high tensile, wear-resisting tread, that will carry heavy loads and withstand severe brake applications without developing brake burns or shellouts.

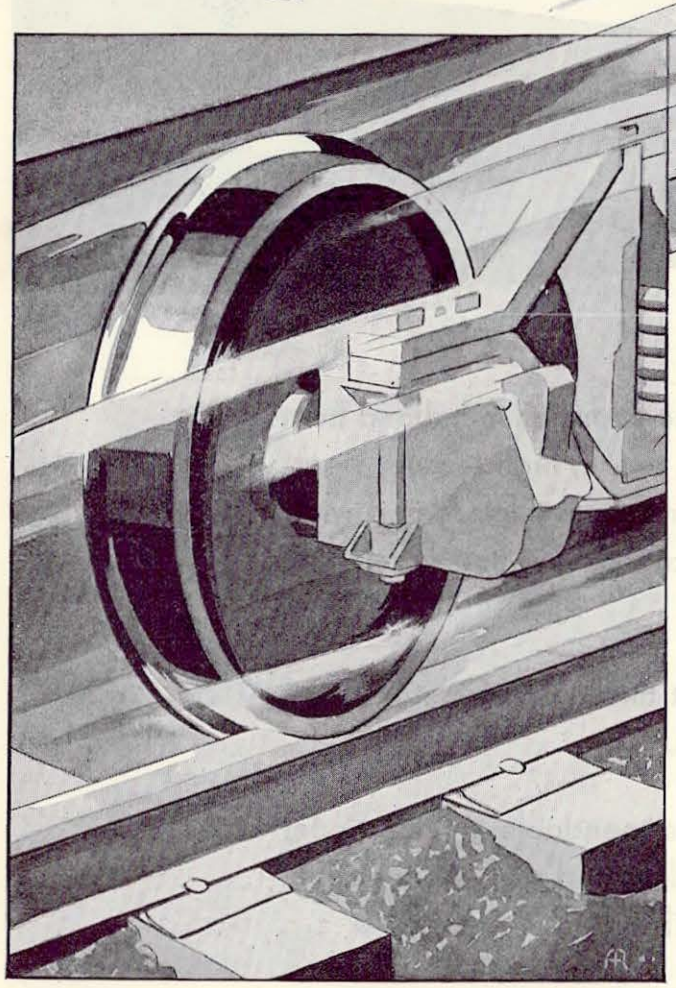
A wheel that has sufficient thickness of metal in the rim to permit several wears.

A wheel that will deliver dependable service under high speed locomotive tenders and passenger cars at a low cost per thousand miles.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

High Wheels on engines call for Wrought Steel Wheels on cars



The day of the slow-moving, low-wheel freight engine is passing, as the high-wheel, fast-freight locomotive takes over more and more of the traffic. Freight trains now tear along the rails at passenger-train speeds. Result: Car wheels have to meet stresses undreamed of a few years ago.

Bethlehem Light-Weight Wrought Steel Wheels are the wheels for this new era of faster freight movement. These wheels, for cars of carrying capacity up to and including 70 tons, are made by the same process as Bethlehem Multiple-Wear Wheels but have a smaller hub and lighter plate and rim. Great strength and endurance and remarkable wearing properties are worked into these wheels during the five distinct forging and rolling operations of manufacture. Forging makes the metal dense and tough, while rolling refines the grain structure, increasing the strength and ductility.

Their safety, their stamina, together with the remarkable mileage of which they are capable, make Bethlehem Light-Weight Wrought Steel Wheels the logical wheels for modern fast-freight service. Bethlehem Steel Company, General Offices: Bethlehem, Pa.

BETHLEHEM STEEL

BETHLEHEM WROUGHT STEEL WHEELS

Published every Saturday by the Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa., with executive offices at 30 Church Street, New York

SAMUEL O. DUNN, *Chairman of Board*
HENRY LEE, *President*
LUCIUS B. SHERMAN, *Vice-Pres.*
CECIL R. MILLS, *Vice-Pres.*
ROY V. WRIGHT, *Vice-Pres. and Sec.*
FREDERICK H. THOMPSON, *Vice-Pres.*
GEORGE SLATE, *Vice-Pres.*
ELMER T. HOWSON, *Vice-Pres.*
F. C. KOCH, *Vice-Pres.*
JOHN T. DEMOTT, *Treas.*

CHICAGO
105 West Adams St.

WASHINGTON
17th and H Streets, N. W.

CLEVELAND
Terminal Tower

SAN FRANCISCO
58 Main St.

Editorial Staff
SAMUEL O. DUNN, *Editor*
ROY V. WRIGHT, *Managing Editor*
ELMER T. HOWSON, *Western Editor*
H. F. LANE, *Washington Editor*

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. A. DOSTER
JOHN C. EMERY
H. C. WILCOX
NEAL D. HOWARD
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
M. H. DICK
S. R. HAMILTON

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, payable in advance and postage free; United States and possessions, 1 year $6.00, 2 years $10.00; Canada, including duty, 1 year $8.00, 2 years $14.00; foreign countries, 1 year $8.00, 2 years $14.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office.

Vol. 95 July 8, 1933 No. 2

In This Issue

What Results From Fare Reductions? ..... Page 80

This is Article No. 3 of the Traffic Development Series; it outlines results of the many special fare concessions and excursion inducements offered by the railroads during the past few years.

Wabash Tests Effect of Front End and Grate Design 84

W. A. Pownall, mechanical engineer of this road, describes results of investigations which showed that a modern 4-8-2 type locomotive delivers 25 to 30 per cent more power with Kiesel front end and Hulson Tuyere-type grates having 14.9 per cent air opening.

A. S. T. M. Has Busy Week at Chicago 89

A report of this organization's thirty-sixth annual convention at which discussions covered a wide variety of subjects relating to materials and their properties.

EDITORIALS

What Does the Future Hold for the Railroad Man? 77
Accidents in 1932 78
Merchandising Research Requires Specialization 78
Abandonment Projects an Education to Taxpayers 79

GENERAL ARTICLES

What Results From Fare Reductions? 80
New Type Deck Used on Reading Pier 82
Wabash Tests Effect of Front End and Grate Design, by W. A. Pownall 84
Claim Agents Meet at Chicago 87
A. S. T. M. Has Busy Week at Chicago 89
A Safe Car Fumigator 90
Freight Car Loading 91
Centralized Traffic Control on P. R. R. 92

NEW BOOKS 93

COMMUNICATIONS 94

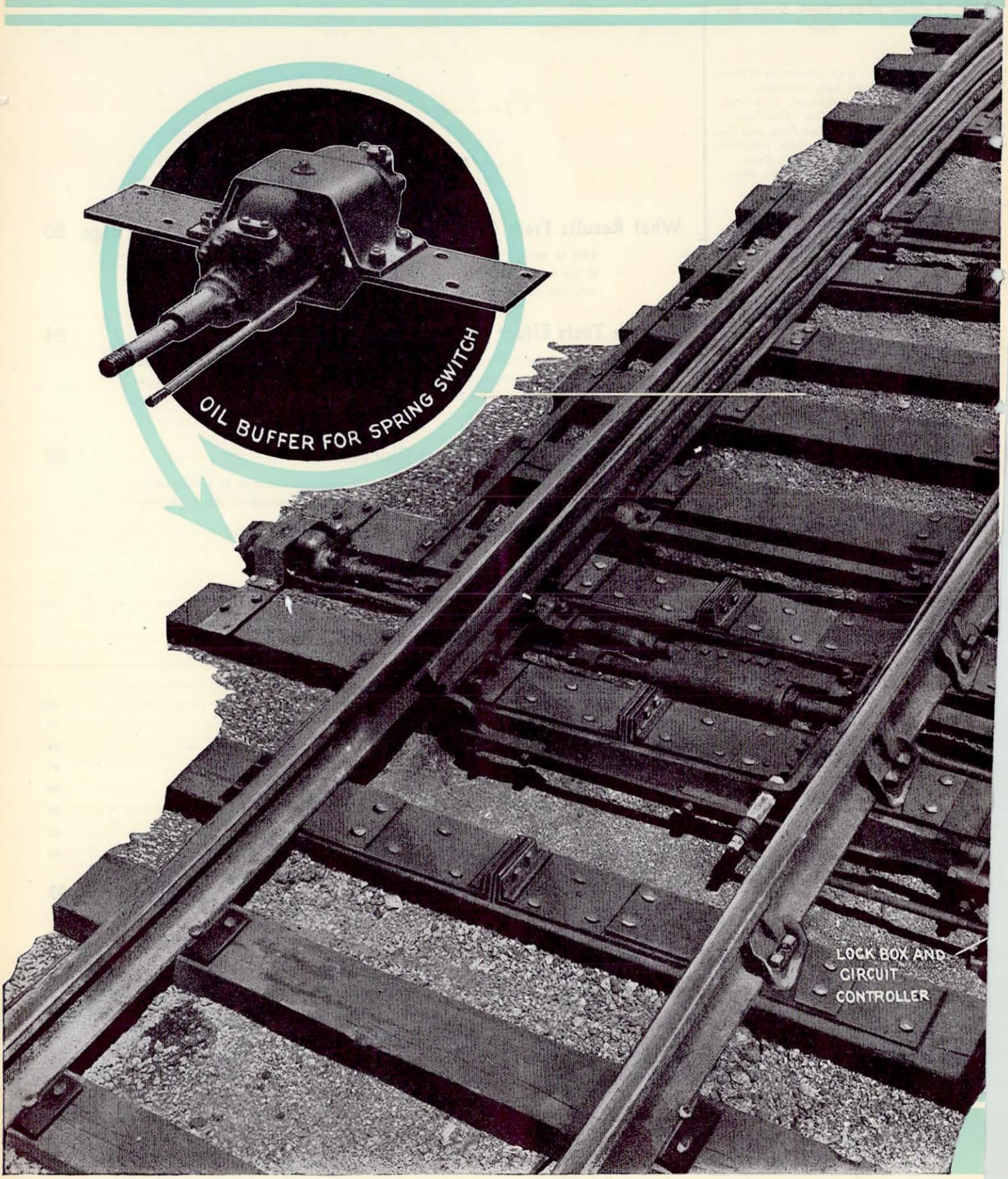
ODDS AND ENDS 95

NEWS 96

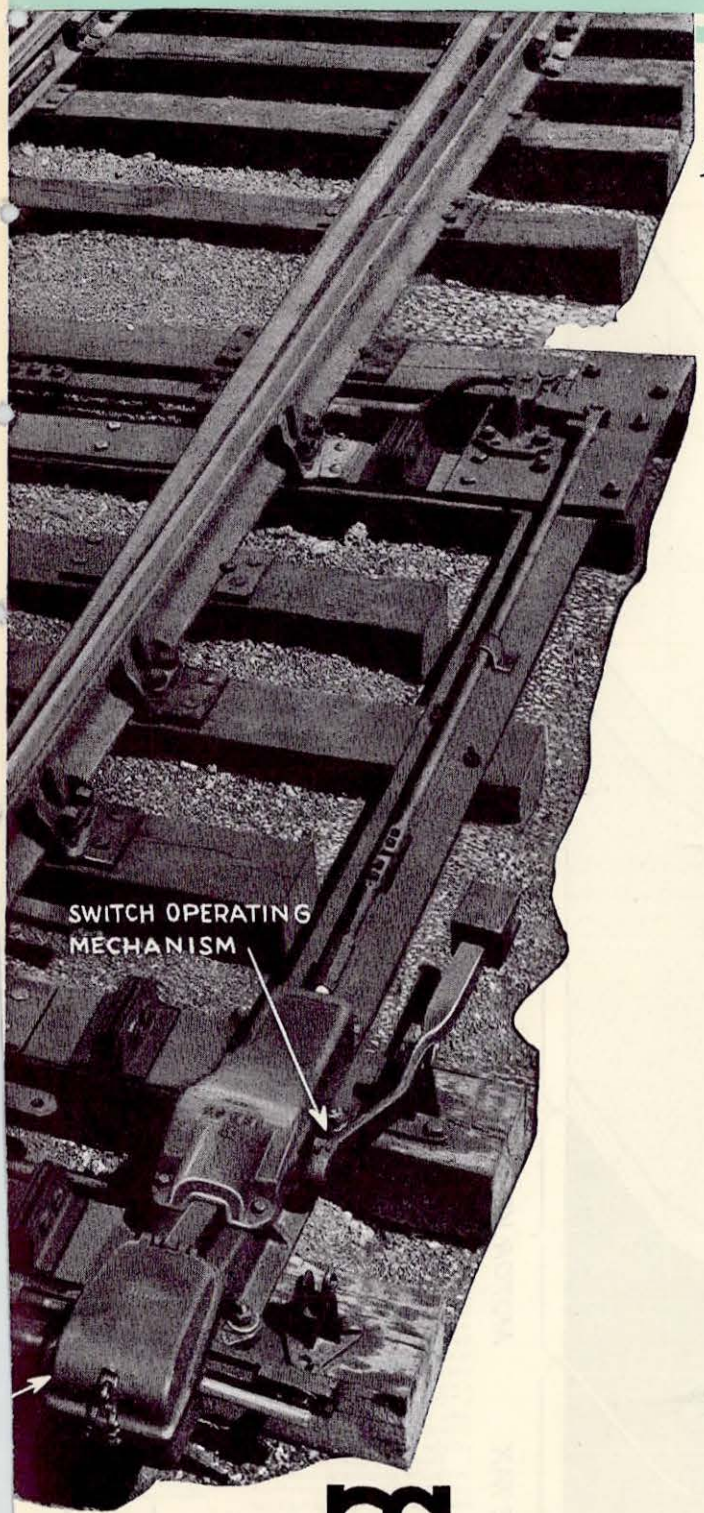
REVENUES AND EXPENSES OF RAILWAYS 103

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

NOW, SPEED WITH SAFE



TY AT SPRING SWITCHES



1881 1933

Mechanical Lock Effective for Facing Point Moves, Automatically Unlocked for Trailing Moves.

THERE is now no necessity for reducing main line speed for facing point moves over spring switches. Through the installation of the new "Union" Style S-1 Mechanical Facing Point Lock on spring switches, high speed may be maintained with safety. The new "Union" Mechanical Facing Point Lock consists of a simple mechanically operated device which locks the switch points and provides the same protection as at interlockings for facing point moves.

Simple in design and rugged in construction, this facing point lock for spring switches provides a locking plunger which automatically unlocks the switch points when a trailing move is made through the switch, and automatically locks the switch points in their normal position upon the completion of the trailing move. The mechanism is equipped with a circuit controller and point detector through the contacts of which are carried the control circuits of signals governing over the spring switch. If the position of the points or of the locking mechanism are such that a facing point move is not permissible with safety, or if the mechanism is not in proper adjustment to unlock the points for a trailing move, the circuit controller and point detector function so as to display the "stop" indication on signals which govern train movements over the switch. The "Union" Style S-1 Mechanical Facing Point Lock for Spring Switches is applicable to any length switch and any existing switch layout. The combination of this lock with the "Union" Oil Buffer for Spring Switches provides for greater operating advantages over such switches than has been possible heretofore.

Secure the complete details of this modern improvement for spring switches from our nearest district office.

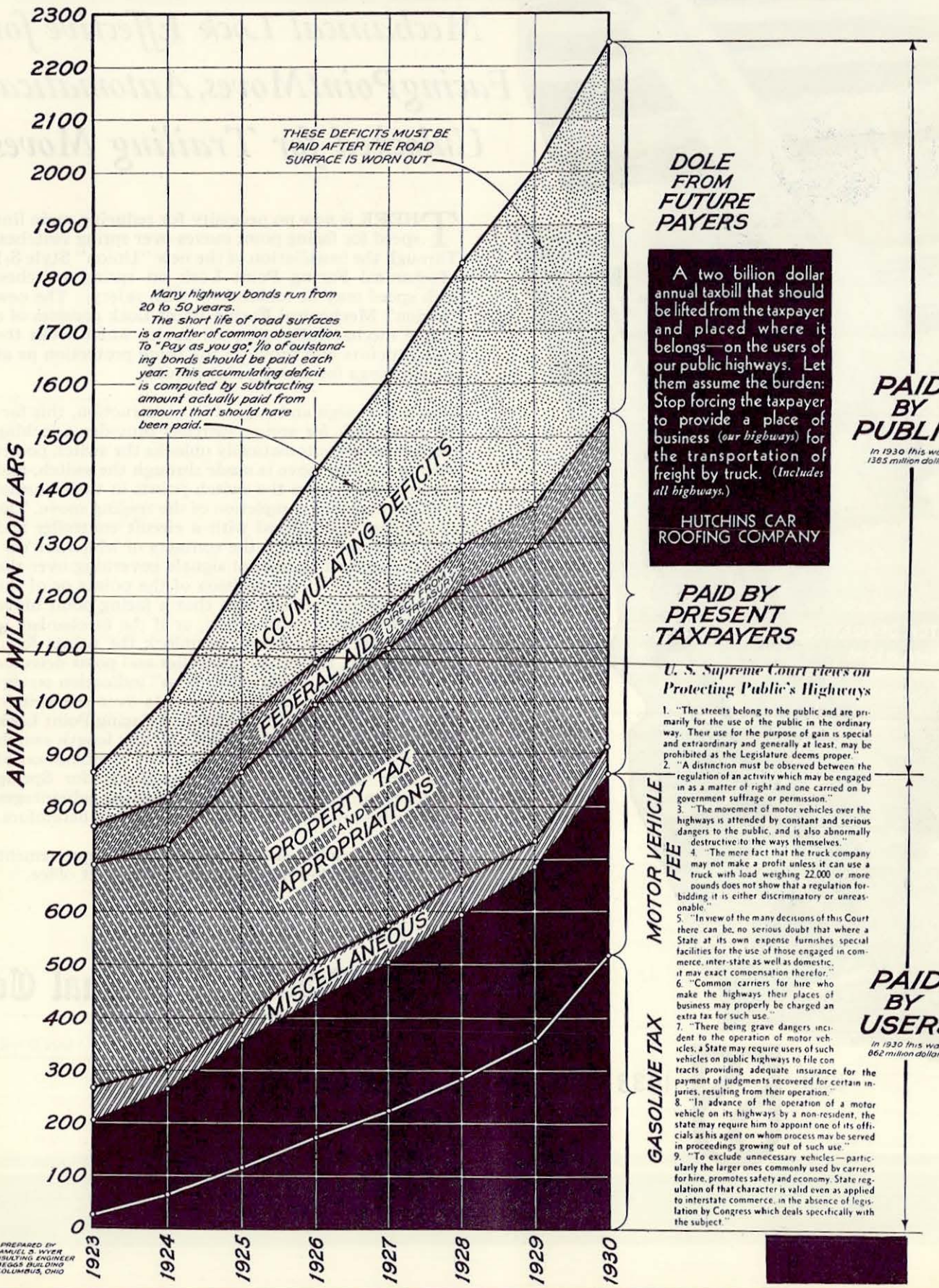
Union Switch & Signal Co.
SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

PUBLIC'S INTEREST IN PROTECTING ITS HIGHWAYS

"USER'S" AND "PUBLIC'S" RELATIVE CONTRIBUTION TO RURAL HIGHWAY COSTS IN THE UNITED STATES FROM 1923 TO 1930

BASED ON DATA FROM U.S. BUREAU OF ROADS



A two billion dollar annual taxbill that should be lifted from the taxpayer and placed where it belongs—on the users of our public highways. Let them assume the burden: Stop forcing the taxpayer to provide a place of business (*our highways*) for the transportation of freight by truck. (*Includes all highways.*)

HUTCHINS CAR ROOFING COMPANY

U. S. Supreme Court Views on Protecting Public's Highways

1. "The streets belong to the public and are primarily for the use of the public in the ordinary way. Their use for the purpose of gain is special and extraordinary and generally at least, may be prohibited as the Legislature deems proper."
2. "A distinction must be observed between the regulation of an activity which may be engaged in as a matter of right and one carried on by government suffrage or permission."
3. "The movement of motor vehicles over the highways is attended by constant and serious dangers to the public, and is also abnormally destructive to the ways themselves."
4. "The mere fact that the truck company may not make a profit unless it can use a truck with load weighing 22,000 or more pounds does not show that a regulation forbidding it is either discriminatory or unreasonable."
5. "In view of the many decisions of this Court there can be, no serious doubt that where a State at its own expense furnishes special facilities for the use of those engaged in commerce, inter-state as well as domestic, it may exact compensation therefor."
6. "Common carriers for hire who make the highways their places of business may properly be charged an extra tax for such use."
7. "There being grave dangers incident to the operation of motor vehicles, a State may require users of such vehicles on public highways to file contracts providing adequate insurance for the payment of judgments recovered for certain injuries, resulting from their operation."
8. "In advance of the operation of a motor vehicle on its highways by a non-resident, the state may require him to appoint one of its officials as his agent on whom process may be served in proceedings growing out of such use."
9. "To exclude unnecessary vehicles—particularly the larger ones commonly used by carriers for hire, promotes safety and economy. State regulation of that character is valid even as applied to interstate commerce, in the absence of legislation by Congress which deals specifically with the subject."

PREPARED BY SAMUEL S. WYER CONSULTING ENGINEER BEGGS BUILDING COLUMBUS, OHIO

What Does the Future Hold for the Railroad Man?

Freight car loadings for the week ended June 24 were 21.2 per cent higher than they were in the similar week of 1932—making the seventh consecutive week this year that loadings have exceeded those of last year; and the percentage of the excess over the comparable 1932 week has been steadily mounting. Similar improvement is to be noted in practically all lines of business, but in no quarter, probably, is it so significant as in agriculture.

The farm is so necessary a market for industry that, unless prices for farm products bear a favorable relationship to the general price level, the farmers cannot afford to buy industrial products in normal volume. Agricultural commodities, as is generally known, have been abnormally low in price for a long period and many competent observers despaired of any substantial improvement in general business until this price disparity had been overcome. This correction is now rapidly occurring. According to a recent review of economic conditions published by the National City Bank of New York, in March of this year the ratio of the prices the farmer pays to those he receives was only 50 per cent of the pre-war average. In May it had risen to 62 per cent, and it has undoubtedly risen considerably since that time. Almost all prices are tending upward, but farm prices are rising more rapidly than prices in general, which they must do to restore the farm as a market for the products of industry. That this change is occurring probably offers more assurance that we are moving out of the depression than the indications of any economic barometer, however encouraging.

The Shippers Regional Advisory Boards have estimated that freight car loadings in the third quarter of the year will exceed those of the 1932 quarter by 10 per cent. If the present trend continues, that estimate will probably prove conservative, but, in any event, it is worth noting that this is the first quarter since 1929 for which the Advisory Boards have predicted an increase. Many persons have expected some recession in business activity during the summer months but, to quote again from the National City Bank's review: "Little is now heard of the expectations of a substantial summer decline. . . . On the contrary, as the season advances with the news continuing good the time in which a recession might be looked for is correspondingly shortened. . . . There is reason to hope that the fall rise in trade will be a substantial one."

The railways, as their earnings figures are beginning to show, are sharing in the upturn. Their continuance in it, of course, will depend in large measure on the rate policy adopted by the regulatory authorities. An equally important factor in their future prosperity, however, will be the alertness of management in providing for the movement of heavier traffic without proportionate increases in expense. The depression has taught lessons of economy, but actual shortage of cash has in some cases made inevitable some false economies as well—such as, for instance, undermaintenance, working high-priced men with inefficient tools, the postponement of modest capital investments which would more than pay for themselves in savings in operating expenses, and failure to maintain adequate supervision. The real economies should be retained, but the restriction on outlays which will increase operating efficiency sufficiently to justify them ought to be removed as soon as earnings make such action possible. Only in that way can true operating economy be secured.

During the depression some railroad men were inclined to grow discouraged as to the future of the business. Not only were economic conditions bad enough in general, but for the railroads the outlook was further darkened by the growth of unregulated and subsidized competition. This attitude of discouragement is, we believe, now largely dissipated. The competitors are still here, it is true, and they have not been effectively dealt with as yet. On the other hand, there is convincing evidence that the railways can experience

a high degree of revival in spite of them. Furthermore, the administration at Washington has promised to support legislation designed to correct, at least to some degree, the competitive situation at the regular session of Congress which convenes in January.

Another strong reason for encouragement lies in the indication that the railroad business is headed for many changes in methods and equipment which are bound to challenge the interest and attention of, and offer opportunities for, alert-minded men. Collection and delivery of freight, new designs of passenger equipment, the better handling of l.c.l. freight to put it on a paying basis, some degree of consolidation, pooling of services, innovations in signaling, lighter weight cars, a change in motive power policy to provide for a shorter and more intense service life, means of putting the passenger business on a paying basis, merchandising research and the application of competitive commercial sales methods to the railroads—all these and many more are developments which railroad men can look forward to almost as certainties, and all can participate in some phase of them. Quite contrary, therefore, to the existence of grounds for discouragement about the future which awaits men who have chosen railroading as a career, the probabilities seem to be that the industry has entered into what may well be one of the most interesting periods through which it has ever passed, and one offering, perhaps, more opportunities for intelligent and hard-working men than have existed for a long time.

Accidents in 1932

While most of the "lows" reached by the railroads in 1932 are matters of serious concern, there is one new "low" in which railroad management can take the utmost pride. Fewer persons were killed in railway accidents in 1932 than in any year since 1888, when a compilation of railway accident statistics was instituted by the Interstate Commerce Commission. Since that time the population of the United States has more than doubled: miles of railway line have increased 60 per cent: railroad traffic has increased fivefold: and highway traffic over railway grade crossings has multiplied many times. Considering these facts, the safety record of 1932 is a vivid reflection of the many improvements in equipment and in operating practices scientifically applied by the railways in recent years.

For the fourth consecutive year there was a substantial reduction in the number of fatalities at highway grade crossings, such fatalities having been reduced from 2,568 in 1928 to 1,525 in 1932, a reduction of 41 per cent. Furthermore, the ratio of casualties resulting from automobiles being struck by trains has declined steadily since 1926. The ratio of casualties resulting from trains being struck by automobiles has been steadily increasing.

In 1926, 10.9 per cent of the total number of fatalities involving motor vehicles at grade crossings resulted from automobiles running into the sides of trains. This ratio steadily increased to 12.6 per cent in 1928; to 14.0 per cent in 1930; and to 19.2 per cent in 1932. Likewise, non-fatal injuries in such accidents increased steadily from 18.9 per cent of the total in 1923 to 24.9 per cent in 1926, to 30.4 per cent in 1928, to 33.7 per cent in 1930, and finally to 40.1 per cent in 1932.

In the light of these figures, "Cross Crossings Cautiously" still needs the utmost emphasis.

Merchandising Research Requires Specialization

C. D. Young, vice-president of the Pennsylvania, in his address before the American Society of Mechanical Engineers in Chicago on June 26, surveying the accomplishments of the railways in the field of research, dealt with one phase of the matter where much yet remains to be done.

"Speaking for myself alone," he said, "there should be a third class of centralized research work, involving what might be termed the business affairs of the railroads. This group of problems should be taken up much more aggressively than has been the case in the past. Under this third classification would fall such matters as studies involving a sounder basis for making and adjusting rates and fares; new forms of transportation service and improvement of existing facilities; co-ordination of rail transportation with other agencies of service; better salesmanship as an aid to more effective solicitation of business, and other kindred subjects. Research into such matters, carried on under central direction, would be free from competitive self-interest and would permit unimpeded study for the benefit of all."

There may be some questions as to whether merchandising research should be centralized under one agency, acting on behalf of all the railroads, as Mr. Young advocates, or whether better results might not be obtained by friendly competition of several such agencies maintained either by the individual railways or territorial groups. Regarding the necessity for research along such lines, however it is conducted, there can be no question at all. The manufacturer of a new shaving soap, or almost any other competitive commodity, usually knows pretty well before he places it on the market about what volume of sales he can expect for a given outlay for advertising. He will know from the researches of his merchandising experts the form of package which will attract customers and he will also know the price at which the sales of his product will yield the highest net return. He will strive constantly to make his product more inviting by field

surveys to determine the likes and dislikes of potential customers.

The railways are coming to this same view of their sales problem, as the current wide experiments with various classes of passenger service and various rates of fare give evidence. In freight service also it appears that the development of the point of view of competitive salesmanship has grown enormously in recent years. The question, therefore, is no longer whether competitive merchandising methods are needed on the railroads, but, rather, how best to apply these methods. When new work appears which must be done, is it not the better policy to assign the task to some one person, relieving him of other responsibilities, rather than dividing the duties among many persons the time of whom is already fully occupied?

That, it would appear, is the point that Mr. Young makes. The task of discovering sound principles of competitive rate making, of proposed changes in service to attract traffic, of co-ordinating rail and other forms of transport and kindred questions has grown so large and is so pressing that it can no longer be allowed to remain a part-time duty of any one man or group of men. It is a specialized problem of the first magnitude comparable possibly to the conduct of water service or fuel conservation, which should be entrusted to an officer, properly assisted, who would devote his entire time to the work and whose reputation would depend entirely upon the skill and ingenuity which he showed in this type of activity.

Abandonment Projects An Education to Taxpayers

One measure of economy which the railroads have been pursuing actively is the abandonment of non-profitable branch lines. So far this year applications have been filed with the Interstate Commerce Commission for the abandonment of 1,100 miles of such lines and scarcely a week goes by which does not see action on several such projects.

While from one point of view, largely sentimental, such abandonment may be looked upon with regret, there is no question but that vigorous action in this quarter is essential to the maintenance of a healthy railroad industry. Railroad transportation where conducted under favorable conditions is about the most efficient form known—its only possible rival being that of large ships on natural waterways. The conditions needed to make railroad transportation efficient are favorable grades and a good volume of traffic. Since state laws or union agreements require several employees on each train, it is not profitable to operate when only a few cars are available per train. Moreover, since property taxes and, to a considerable extent, maintenance of way expenses, do not vary with traffic, these costs become excessive if the volume of business falls too low. Railroad transportation under such conditions loses its natural superiority and its costs per ton-mile or per passenger-mile may rise above that of highway transportation.

The perpetuation of a railroad under such conditions is as indefensible economically as is the building of heavy-duty motor roads at the expense of the general taxpayers since, in either case, the result is the payment of a large share of transportation costs by persons other than the users. In addition, the more of such lines which are kept in operation at a loss the higher must the general level of rates be. A high rate level, of course, enables other forms of transportation to compete with the railroads in fields where the railroads are actually more efficient. Bus and truck lines serve only those points where profitable traffic is available and there is no reason why railways should operate under any other principle.

Before the general use of motor vehicles the abandonment of a railway line would have worked great hardship on patrons of the line. Good roads and motor transportation remove this objection, so that the hardship, where there is any, falls entirely on the taxpayers who have to make up for the loss of such payments from the railroad, since the bus and truck lines pay no net taxes over and above road costs, and upon shippers and receivers of low-rated commodities who find that trucks will not handle their traffic at rates as low as those of the railroads. The attitude of the commission has been favorable to action of this kind, its position being well-stated in a paragraph from a recent decision—

> Use of the branch by the people of the tributary territory has been materially reduced in recent years through diversion of their travel and freight to motor vehicles operating on the highways. The volume of business now available is not sufficient to produce revenues that will support the cost of operating the line even under conditions favoring minimum expense. Consequently operation of the line involves losses which are an unjustifiable burden upon interstate commerce, and the record offers no definite prospect of any such increase in the traffic as to justify the hope that the line might become self-sustaining.

An abandonment project provides an education in transportation economics for the population in the territory affected. Unfortunately the lesson usually is learned too late to enable the community to take the corrective measures which would restore the traffic to the railroads and permit the operation to be continued. The need for broader understanding by the tax-paying public of the issues involved is strikingly exemplified by the opposition of authorities to the abandonment of a branch line in West Virginia by the Norfolk & Western. The line in question yields some $68,000 annually in taxes. The counties traversed by the line have outstanding an issue of highway bonds and, they contend, they need the taxes the railway pays to enable them to meet these obligations. If highways were paid for by the users rather than the general taxpayers, this difficulty would be avoided.

What Results From Fare Reductions?

Low rates placed in effect during the past few years have created considerable traffic

Low Rates Attract Large Crowds

TO what extent will reductions in fares affect revenues? This question is difficult to answer in view of the complexity of the factors controlling passenger travel. As pointed out in the *Railway Age* of June 24, one group of railroads opposes a reduction in the basic rate on the ground that it will not create enough additional business to offset the resulting loss in passenger revenues, while another group of railroads contends that some traffic will be created and that the rate should be reduced even if revenues decrease as a result, in order to arrest the decline in passenger traffic and allow the railroads to continue in the passenger business. Both groups agree that the additional traffic that will be created by a lower basic rate will not produce passenger revenues equal to those of previous years. The amount of traffic that will be created is a paramount issue in the consideration of the passenger traffic problem.

Estimates as to the future trend of passenger traffic of the railways of the United States vary greatly. Some railroad men contend that a permanent level was reached in 1931 when the railroads carried 599,227,000 passengers or 47 per cent of the number carried in the peak year 1920, that in the future this number will vary only slightly with economic conditions and population increases and that a reduction in the basic rate will not change the situation materially. Another contention is based upon the principle that demand varies inversely with cost (that is, the lower the price the greater the demand) and that rates should be fixed above a point below which the increase in the volume of business will not compensate for the lower price and lead to a diminution in total revenue.

Excursions Create Traffic

The argument that passenger travel can be increased by lower rates is supported by the experience of several railroads in operating low fare excursions during the past few years. Incidentally, the excursion has been one of the first methods used by the railroads to reduce the basic passenger rate and has been employed for a number of years. The Southern, for example, was especially active in conducting excursions during 1932, and handled 316,482 excursion passengers who provided a revenue of $1,213,034. On June 18 more than 25,000 persons took advantage of the cent-a-mile rates offered in commemoration of the thirty-eighth anniversary of the road's incorporation. The low-fare tickets, with a return limit of eight days, were available for journeys between all points on the Southern and also to certain destinations on connecting lines. A large part of the success which attended the event was due to the wide-spread manner in which it was advertised and publicized, the advertising campaign including the use of the radio and newspapers.

The efforts of this railroad have been continued into 1933, with equally satisfactory results. Of a series of seven major excursions, at a rate of one cent per mile, that are being operated at approximately monthly intervals, the two that have been run to date have each produced revenues in excess of $100,000.

In 1932, a variety of excursions were operated by other railroads with considerable success. Week-end excursions operated by the Missouri-Kansas-Texas were particularly successful on the week-ends of June 12 and 25, more than 1,000 excursionists being carried into St. Louis and Kansas City on June 12 from various points along the lines, while on the week-end of June 25, 3,000 passengers were carried between various points in Texas. On the same day 750 excursionists were handled from St. Louis and Kansas City to local points.

Excursion rates in effect over Sunday, July 17, on the St. Louis-San Francisco produced a record amount of passenger excursion business for that year, 7,500 passengers being handled on Frisco passenger trains at excursion fares ranging from $1 to $2 a round trip. One of the most successful passenger excursions was that operated by the Chesapeake & Ohio on July 17, from Huntington, W. Va., and intermediate points, to Cincinnati, Ohio, a distance of 161 miles, when 3,044

passengers were carried. A one-day trip was operated at a rate of $1 for the round trip and the patronage was handled in two trains of 20 coaches each. Another successful low-rate round trip excursion was operated by the St. Louis-San Francisco on July 31 from various points to Kansas City, Mo., St. Louis, Joplin, Tulsa, Okla., Oklahoma City and Birmingham, Ala., when 1,858 persons were carried.

Excursions operated by the Chicago, Milwaukee, St. Paul & Pacific and the Chicago & North Western between Chicago and Milwaukee, Wis., on August 14, drew 3,500 persons in each direction, with a rate of $1 for the round trip of 170 miles. By mutual agreement, the North Western operated an excursion from Chicago to Milwaukee, while the Milwaukee operated one from Milwaukee to Chicago.

More than 100,000 passengers, including many who had never been on a train before and others who had never seen the inside of a sleeping car, were handled by the Southern at its "Train Travel Bargain Fare" rates during July and August. On the Norfolk & Western, excursion business in July and August was well patronized. One excursion attracted 2,500 passengers while others were patronized by crowds of from 600 to 1,000.

The Southern Pacific in 1931 and 1932 established its "dollar day" on which it offered transportation at approximately one cent a mile. These rates, placed in effect at times on the entire system and at other times between certain points, were highly satisfactory.

In order to increase interest in excursions, the railroads in 1932 introduced the "mystery excursion," wherein the destination is unknown and mystery, romance, adventure, education and diversion are featured. These were first operated by the Missouri Pacific out of St. Louis on May 21, 1932, by the Baltimore & Ohio out of Chicago on May 22, and by the Southern out of Cincinnati on May 30. To emphasize the imaginative appeal of these excursions, they were advertised by such statements as "Your destination's a secret. Your engineer's under sealed orders. Your comfortable train has a blind date with a big blue lake and luxurious hotel—and that's all anybody knows." The Southern, in advertising its first mystery tour, further hinted at the full program of entertainment, which was provided as an integral feature of the trip—the announcement of the Cincinnati excursion, described as being "particularly for those who like the birds, flowers, rivers and wide open spaces," also said: "There will be a railroad ride of 200 miles; there will be an automobile trip of 50 miles; there will be an orchestra; there will be a chicken dinner."

The results of these mystery tours and others operated during the year were highly satisfactory. The excursion operated by the Missouri Pacific from St. Louis to Arcadia, 92 miles, drew only 50 reservations, but 450 passengers appeared at train time. The Baltimore & Ohio tour from Chicago to Lake Wawasee, Ind., 120 miles, drew 130 passengers on a cold day. The Southern's excursion from Cincinnati proved so popular that 600 tickets had been sold as early as May 28, two days before the event, while the trip was actually patronized by 2,000 persons. A second mystery trip operated by the Southern from Washington on June 5 attracted 500 persons. A mystery excursion operated from the Twin Cities to Green Lake at Spicer, Minn., on July 16 attracted 457 revenue passengers, 90 per cent of which were women.

One of the most successful mystery excursions operated in the Chicago territory was handled on August 7, when the Chicago & North Western carried 772 patrons on a $2.25 mystery trip from Chicago to Lake Geneva, Wis., a distance of 92 miles. The features of the trip were a boat ride and a chicken dinner. Because of numerous requests, the C. & N. W. had to conduct another excursion to Lake Geneva.

Mileage Books

A more recent device for reducing the basic rate is the mileage book which was in use on railroads some 15 years ago. It enables the traveler to purchase large amounts of railroad transportation at a discount and consequently has been advocated particularly by traveling men.

Beginning February 1, railroads affiliated with the Transcontinenal and the Western Passenger associations offered mileage books at a price amounting to a 25 per cent reduction in fares. One book, good for 3,000 miles and containing $108 in coupons, sells for $81 and is good on all lines west of Chicago; St. Louis, Mo.; Memphis, Tenn.; and New Orleans, La. Another book containing $72 worth of coupons, 2,000 miles of travel, is sold for $54 for use between the eastern points mentioned and Texas, eastern New Mexico, Utah, Wyoming and Montana.

While figures on the sale of mileage books are not available from all of the western railroads, the record of the Chicago & North Western is significant, this railroad having sold 2,966 books as of May 31 to the value of $129,000 with a mileage totaling 7,000,000. These include 1,068 books at $81, and 1,898 books at $54. Reports from agents show that this scrip is returning travel to the rails. A refrigerator concern in Detroit has instructed its men to purchase mileage books and use the railways instead of automobiles. A salesman, traveling 50,000 miles a year between Chicago and Omaha, Neb., and Texas points, returned to rail travel. A traveling salesman in Oak Park, Ill., is using the railroads for the first time. A patron in Dixon, Ill., expects to use 40 books a year. A company in Madison, Wis., purchased five books.

Class Rates

Another method of reducing the basic rate has been through the establishing of class rates. On June 1, 1930, carriers operating between Chicago and the Pacific Coast placed in effect for a period of six months additional one-way fares, which virtually established a second-class

In the Issue of July 22

The next article of the series will appear in the *Railway Age* of July 22. It will show the extent to which air conditioning has been applied to passenger trains, both full trains and individual cars; will discuss the manner in which this service has been advertised and promoted; and will describe the results secured, especially from the standpoint of traffic recovered from competing types of carriers. The article will also point out that air conditioning increases the comfort of train travel in the winter time, as well as in the summer; and will discuss the traffic-producing value of fully air-conditioned trains over the air conditioning of one or two cars in a train.

rate of about 3 cents per mile in tourist sleepers, and a third-class rate of 2.3 cents per mile in coaches, in addition to the first-class rate of 3.6 cents per mile in standard sleeping cars. This type of rate has been continued in effect and at the present time the rates between Chicago and California and the Pacific Northwest are $79.84 for first class, $50 for second class and $40 for coaches. The rates have been particularly effective in encouraging tourist travel and in competing with motor coaches, the through coach business of the railroads having grown to large proportions.

Party Fares

Still another measure to stimulate travel by rail through the reduction of the basic rate is party rates for small groups, which have been tried with success. On September 25 and 26, 1931, railroads in the Southwestern Passenger Association territory offered family bargain fares from points on their lines to points in Texas, the rates being designed to induce the taking of the family along at little additional cost. The rates were fixed on a sliding scale, so that the round-trip rate per person varied with the number of persons transported. For example, the regular round-trip adult fare from St. Louis to Dallas is $48.06, while under the party rates, one adult ticket cost $26, two adults on one ticket $41.60 and five adults on one ticket $55.

More recently, on June 1, 1933, railroads in the Western Passenger Association territory established coach party fares to Chicago for parties of from two to five attending the Century of Progress Exposition to meet the private automobile situation. Under this schedule of rates, which provides for a return limit of 10 days, the checking of 100 lb. of baggage for each adult and 50 lb. for each child of half-fare age and stopovers at all points, three passengers are charged one fare for the round trip per capita; and five or more passengers 85 per cent of the one-way fare for the round trip per capita. Thus far these rates have been especially popular since it is more convenient to travel to the Century of Progress Exposition by train than by automobile and because the low rates for parties are economical.

Frisco and L. & N. Experiments

While the carriers have offered these special rates for years, it was not until 1931 that any railroad reduced the basic rate. The first railroad to offer a reduced basic rate was the St. Louis-San Francisco, which placed a two-cent-per-mile rate into effect between all points on the system for a period of six months from February 1 to August 1, 1931. The second railroad to experiment to determine the effect of lower rates is the Louisville & Nashville, which was followed by the Nashville, Chattanooga & St. Louis, the Gulf, Mobile & Northern and the New Orleans Great Northern. On April 1, 1933, these railroads reduced the basic rate to two cents (for a period of six months) and made the rate applicable to interstate tickets.

In the case of the St. Louis-San Francisco, the two-cent rate was withdrawn on July 1, 1931, because its passenger revenues continued to decline during the experimental period. J. R. Koontz, vice-president, in a report to the Alabama Public Service Commission said: "We have had two-cent passenger fares in effect for a period of three months. At the time of promulgation we advised you it was experimental. Possibilities are that the period of depression is not conducive to a true test, but our experiment has not served to increase travel and has resulted in substantial monthly losses in our passenger revenue." During the period in which this rate was in effect, a period which coincided with the depression, the passenger revenues of the carrier were the lowest in the history of the railroad. However, the experiment did show that a large number of persons were induced to use the railroad.

During the five months in which the rate was in effect, the passenger revenues were as follows: In February, $475,657; in March, $461,110; in April, $470,195; in May, $509,084; and in June, $529,450. In July and August, after the 3.6 cent rate was restored, the revenues were $457,083 and $479,026, respectively. An analysis of the revenues shows that for the six months prior to the experiment the average decrease in passenger revenues was 35.3 per cent, while during the five months of the experiment the average decrease was 33.4 per cent and for the six months after the experiment it was 37 per cent.

Two-Cent Rate Brought Local Business

These figures seem to indicate that the two-cent rate actually did retard the normal rate of decrease, even under the unfavorable conditions when business activity was 14 per cent less in volume than during the previous six months. The rate was especially effective in increasing the revenue from local travel, revenues from which were $269,546 in January, 1931; $271,609 in February; $288,661 in March; $288,886 in April; $306,616 in May; $291,712 in June; $240,477 in July and $245,745 in August.

The most recent experiment in reducing the basic rate is that of the Southern Pacific and the Atchison, Topeka & Santa Fe. The Southern Pacific on July 1 placed a two-cent rate in effect between all points of the railroad between San Francisco, Cal., and Ogden, Utah; Portland, Ore., and El Paso, Tex., for a period of 90 days, the rate to apply to tourist sleeping cars and coaches. In applying the low-rate the railroad expects to make it permanent if the results warrant. Following the action of the Southern Pacific, the Atchison, Topeka & Santa Fe established the same rate on its lines west of Albuquerque.

While these results indicate that patrons will take advantage of low rates, they cannot be interpreted as conclusive evidence that the same results will prevail if the basic rate is reduced on all railroads. It is apparent that if one railroad has a low rate and a competing railway has not, patrons will patronize the one with the low rate. Also, many travelers will postpone or advance their trips in order to take advantage of low rates. For these many reasons, any definite conclusion as to the effects of low rates is impossible because of the complex issues involved.

New Type Deck Used on Reading Pier

IN rebuilding its coal pier at Port Richmond, Philadelphia, Pa., on the Delaware river, which was partially destroyed by fire in 1931, the Reading has used a new type of floor construction, built up of standard structural steel channels. In this construction, channels are reversed alternately, base up and down, so that the flanges of adjacent units interlock. The troughed steel surface presented in this construction is leveled off by asphalt filler planks, placed in the troughs, and a smooth

wearing surface is provided by a continuous top course of asphalt planking.

The Reading pier at Port Richmond, which is used extensively in the coaling of ships and barges in both domestic and freight service, is approximately 775 ft. long, 55 ft. wide and 35 ft. high, and supports four standard-gage tracks on 12-ft. 1-in. centers. It is of heavy timber construction throughout, with numerous hoppers below the deck, into which coal is dumped from hopper-bottom cars and then discharged into boats. The deck of the pier was of plank, with suitable openings between the track rails, serving the hoppers.

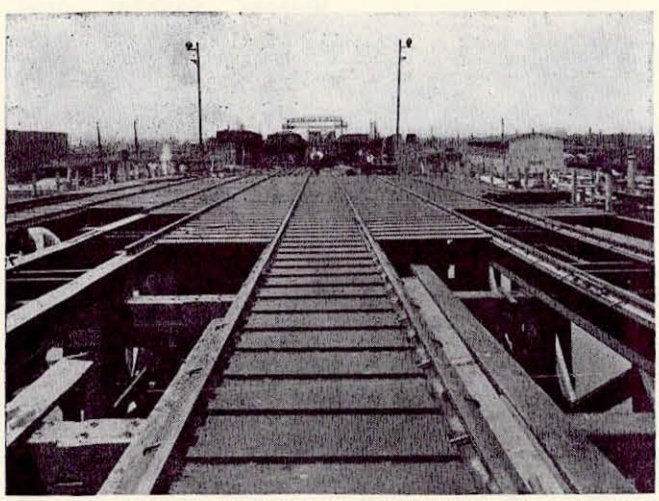
Details of Floor Construction

Following a fire, which destroyed approximately 290 ft. of the offshore end, it was decided to rebuild this section, using the interlocking channel floor construction. In this reconstruction, the substructure of the pier was renewed with heavy timber bents, caps and bracing, but instead of timber stringers and crossties to support the track rails, wide-flange beams were used as stringers, and the rails were clamped directly to them. Closure of the deck between tracks and between track rails, except at hopper openings, was then effected entirely with the interlocked channels, laid transverse to the longitudinal axis of the pier and made to rest on the outer edges of the stringer flanges, close to the bases of the track rails. In this position, the channels were tack-welded together on their top side along their lines of intersection, and were also welded to the stringers at their ends.

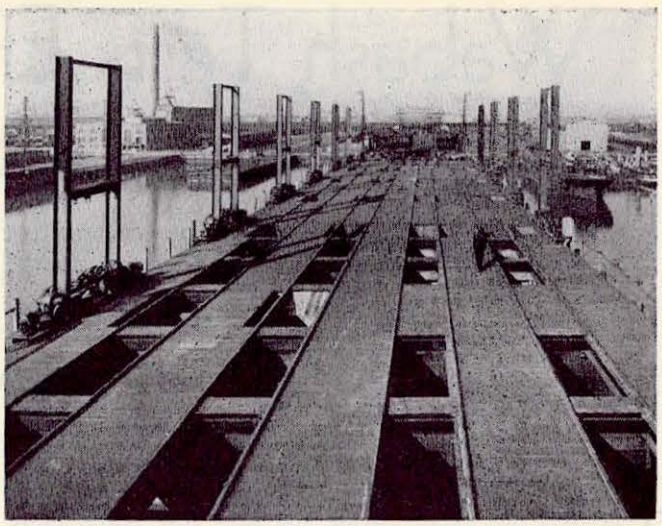
The stringers used are 16-in., C. B. sections, while the channel floor plates used are 10-in. and 12-in. J. & L. sections. Between track rails the channel sections are 4 ft. 5 in. long, while between tracks they are 6 ft. 6 in. long.

The webs of the top channels are notched at the ends to permit rail clamps to pass around the top flanges of the stringers. The clamps used are 1-in. rods, bent so that their lower ends hook over the top flanges of the stringers, while their upper ends, which are threaded, pass through holes drilled in the web of the rail, where they receive nuts. By using the clamps alternately on opposite sides of the rail, the rail is brought to true alinement as well as being made rigidly secure to the stringer.

Between tracks the interlocked channel floor has capacity for a uniform load of approximately 430 lb. per sq. ft., while between track rails, where the span is shorter, it has a safe carrying capacity of approximately 1,150 lb. per sq. ft.; in both cases more than ample for any contemplated loading. The weight of the flooring, exclusive of the stringers carrying the track rails, is approximately 11.2 lb. per sq. ft.



The Pier Deck Under Construction Showing Timber Framework, Steel Stringers, Rail Clamps and a Section of the Interlocking Channel Deck



The Completed Deck, Which is Paved With Preformed Asphalt Bridge Planking

The wearing surface of the deck was built up by first filling the troughs in the top surface of the channel plate construction with preformed asphalt filler planks, approximately 8½ in. wide by 1½ in. thick, bonded to the steel by hot asphalt; and by then laying a ¾-in. wearing surface over the entire deck, made up of preformed asphalt bridge planking, set in hot asphalt. Asphalt mastic was used to fill in around the base of the rails, so that the deck surface is continuous between rail webs. The asphalt wearing surface added about 20 lb. per sq. ft. to the weight of the floor, making a total weight of steel and wearing surface equal to approximately 32 lb. per sq. ft.

This new type floor construction, which is furnished in welded sections by the Belmont Iron Works, Philadelphia, and called the Belmont rolled structural steel interlocking floor, is fabricated of different weights of material to meet different strength requirements, and is said to be adapted for rail and highway bridge decks and for all classes of building floor construction. Some of its principal advantages are light weight, flexibility in design, and simplicity and economy of erection.

The rebuilding of the Port Richmond pier of the Reading was planned and carried out under the direction of Clark Dillenbeck, chief engineer, assisted by C. H. Hitchcock, designing engineer. The field construction was done by Reading forces under Frederick Jasperson, while the waterproofing was done under contract by R. V. Rulon, contractor, Philadelphia.

RAILWAYS OF INDIA for the year ending March 31, 1932, reported gross revenues equivalent to $354,800,000 if rupees be converted to dollars at par (36.5 cents). Operating expenses were $252,182,000 and net revenues $102,618,000. Comparable figures for the previous year ending March 31, 1931 are: Gross revenues, $388,980,000; operating expenses, $270,955,000; net revenues, $118,025,000. Railways owned and operated by the government of India and government-owned lines operated by private companies under a guarantee of interest taken together normally account for nearly 90 per cent of Indian railway revenues. For 1931-32 these government-owned lines reported a deficit after interest charges equivalent to approximately $33,500,000 as compared with a 1930-31 deficit of $19,000,000.

Wabash Tests Effect of Front End and Grate Design

Modern 4-8-2 type locomotive delivers 25 to 30 per cent more power with Kiesel front end and Hulson Tuyere-type grates having 14.9 per cent air opening

By W. A. Pownall

Mechanical Engineer, Wabash, Decatur, Ill.

THERE has been, during the past few years, more or less work of an experimental nature with various designs of locomotive front ends and with grates of special design and low percentage of air opening.

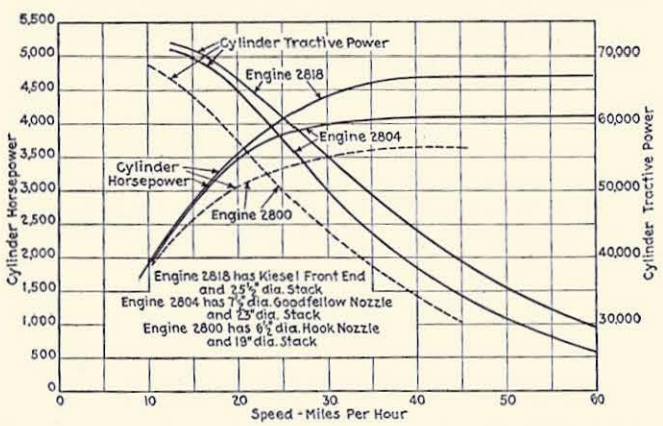
In view of the large increase in cylinder horsepower brought about through certain changes in grates and front ends, it may be of interest to the readers to have more information in detail as to the nature of the changes and the results obtained.

The Wabash locomotive, on which these tests were made, was a Mountain type built in 1930 and of the dimensions shown in one of the tables. The locomotive has a Type-E superheater, thermic syphons and Worthington Type-S feedwater heater.

General Dimensions of the Wabash Mountain-Type Locomotive Tested

Cylinders	27 in. by 32 in.
Steam pressure	245 lb.
Diameter of drivers	70 in.
Tractive power	69,400 lb.
Weight on drivers	270,400 lb.
Total weight of locomotive	406,400 lb.
Total weight of locomotive and tender	697,400 lb.
Total heating surface	4,620 sq. ft.
Superheating surface	2,004 sq. ft.
Grate area	84.2 sq. ft.
Normal cylinder horsepower	3,214

Some of the locomotives were in fast heavy freight service between Kansas City, Mo., and Moberly, and, while they actually developed 3,650 indicated horsepower as compared with the normal expected horsepower of 3,214, it was felt that their steaming was a little too sensitive to temporarily adverse conditions in the firebox, flues or front end. Piping to and from the feedwater heater, which is located in and at the top of the extension front, apparently offered some impedance to the flow of gases, and the first effort was to change the netting and plates in the front end so as to permit an unobstructed flow of gases. The deflecting plate, which had almost under it on the right side a cast-iron pipe leading from the exhaust stand to the feedwater heater, was changed from in front of the exhaust stand to in the back of it and was raised about 2 in. Netting, 28 in. by 42 in., replaced solid plate in the back wall.



Cylinder Horsepower and Tractive Force Developed by Wabash Class M-1 Mountain-Type Locomotive

From observations of some research work being done at the University of Illinois, we learned that the stacks on most locomotives were too small and chocked the exit of the smokebox gases, so we increased the stack diameter from 19 in. to 23 in. (It has since been further increased to 25½ in.) Then it was decided to replace the round hook-type exhaust tip 6½-in. diameter with the Goodfellow-type tip, the diameter of which was finally set at 7½ in. These locomotives were equipped with Hulson Tuyere-type grates, with an air opening 43 per cent of the total grate area, and, in view of the expected increased draft and also a desire to learn something about restricted air-opening grates, the grates were changed to Hulson Tuyere-type with 14.9 per cent air opening. The diagram illustrated in the previous article, shows the original front end, the front end changed in line with the above description, and the Kiesel-type front end which will be discussed later.

The distance from North Kansas City to Moberly is 125 miles, 98 of which are slightly down grade (1 ft. per mile); then there are two grades of about .8 per cent, two miles long, and a 9-mile grade with a number of curves and considerable one-per cent grade. This last hill, called Huntsville hill, is the ruling grade, and the profile is illustrated. Although there are no grades for about 100 miles, the schedule time of the freight trains is so fast that the full power of the locomotive is demanded for the entire run, and this section of road, therefore, offers an excellent proving ground. The adjusted tonnage rating is used with a car factor of 5.

Average Performances with Three Types of Front Ends and Grates

	Standard Master Mechanics' front end	Modified front and Goodfellow tip	Kiesel front end
Tons per train—actual	3,209	3,658	3,874
Ton-miles per train-mile	103,300	134,185	146,835
Time in motion—hr. and min	3-53	3-25	3-18
Coal—lb. per sq. ft. grate per hr	93.9	115.8	132.0
Coal—lb. per 1,000 gross ton-miles	76.6	73.0	75.9
Speed in motion—m.p.h.	32.2	36.7	37.9
Draft—back of deflector plate, in	7.34	11.3	16.1
Superheated steam—Average	654 deg.	681 deg.	697 deg.
temperature—Maximum	670 deg.	691 deg.	720 deg.
Front-end gas —Average	560 deg.	582 deg.	609 deg.
temperature—Maximum	580 deg.	598 deg.	638 deg.
Indicated —Average	....	4,065	4,748
horsepower—Maximum	3,650	4,235	4,931

This class of locomotive was rated at 3,850 tons. The locomotive, equipped as described above, was able to handle 4,350 tons on the fastest freight trains and make up 20 minutes on a four-hour schedule. Coal from the Bevier, Mo., seam, with heating value of 11,200 B.t.u., was used and the locomotive steamed freely. Maximum indicated horsepower was 4,235 as compared with 3,650 for the standard locomotive and 3,215 from Coles ratios. Ton-miles per train-hour showed a 30-per cent increase over the standard locomotive, superheat temperature increased from 654 to 681, and draft over the fire was 57 per cent greater. The locomotive performed consistently with the above improved performance.

Now we had noted in the published performance of the Timken locomotive that the actual drawbar horsepower developed was considerably in excess of Coles cylinder horsepower, this excess being 40 per cent at 40 m.p.h. The only outstanding feature of the design that would affect the steaming capacity of this locomotive seemed to be the Kiesel front end. It was, therefore, decided to see if the use of this type of front end on our Mountain-type engine would not still further improve the performance. Locomotive 2818 was equipped with the Kiesel front end, with a six-ported star-shaped exhaust nozzle, having finally an area of 53.1 sq. in., a 25½-in. diameter stack and Hulson Tuyere-type grates with 14.9-per cent air opening. During testing, grates with air opening as low as 10.8 per cent were used, but the 14.9-per cent grate was ultimately selected as the one that would furnish sufficient air under all normal conditions. A drawing of this nozzle is shown. All designs for the Kiesel front end and grates were furnished by the Hulson Grate Company.

Test runs for comparative purposes were run with the Bevier coal between North Kansas City and Moberly, and later the locomotive was used on other districts with Illinois and West Virginia coal. The maximum train handled from North Kansas City to Moberly was 4,675 tons in 3 hr. 10 min. actual running time. The maximum indicated horsepower was 4,931 (using coal with 11,200 B.t.u.), as compared with 3,650 for the standard locomotive. Ton-miles per train-hour showed 42 per cent increase over the standard locomotive, superheat temperature increased from 654 deg. to 697 deg. average, and maximum from 670 deg. to 720 deg. The draft in the front end averaged 16.1 in., as compared with 11.3 in. for the Goodfellow tip, and 7.34 in. for the standard.

Average of 12 High Horsepower Cards for Locomotives With Improved Front Ends

	Modified front end Goodfellow tip	Kiesel front end	Per cent increase or decrease for Kiesel front end
Indicated hp.	4,065	4,748	16.7 inc.
Indicated hp.—maximum	4,235	4,931	16.4 inc.
Back pressure—lb.	18.2	16.1	11.5 dec.
Back pressure—hp.	793	715	9.8 dec.
Per cent back pressure hp. to indicated hp.	19.5	15.0	23.1 dec.
Speed—m.p.h.	48.4	49.5	2.4 inc.

The locomotive steamed freely, cleaned the front end well and delivered high power on several districts with Missouri, Illinois and West Virginia coals. The average performances with the three types of front-end grates are shown in one of the tables.

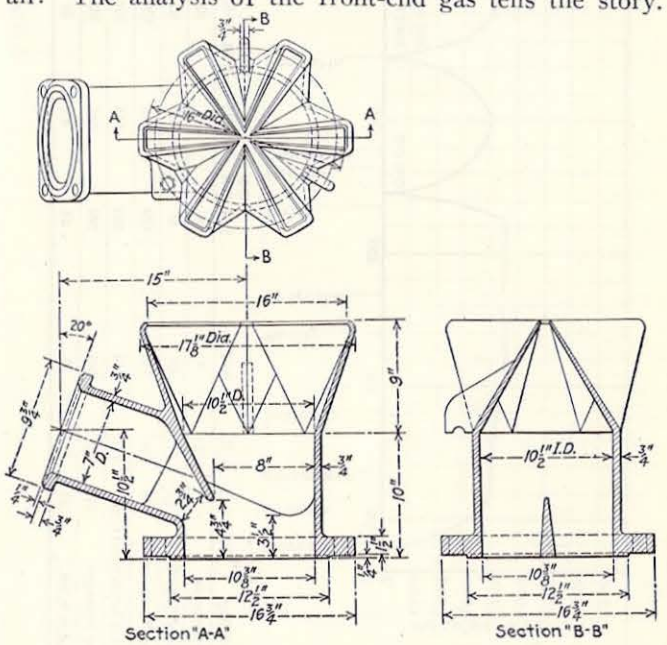
Indicator cards were taken from the right side of the locomotives, and these were measured up carefully for back pressure, back-pressure horsepower and total cylinder horsepower. The average of 12 high horsepower cards for the locomotives with improved front ends are shown in another one of the tables.

The back pressure may appear high, but it should be remembered that the locomotives were being worked at a comparatively long cut-off and high speed (nearly 50 m.p.h.) in order to arrive at the maximum possible horsepower. The high sustained power of the engine with the Kiesel front end is shown by the horsepower curve plotted from 31 indicator cards taken between North Kansas City and Moberly. It will be noted that most of the horsepowers were between 4,500 and 4,900. This graph also shows the back pressure, per cent cut-off, superheat temperature, flue-gas temperature, boiler pressure and speed at the times the cards were taken. One of the drawings shows the cylinder horsepower and cylinder tractive force for the three front-end arrangements.

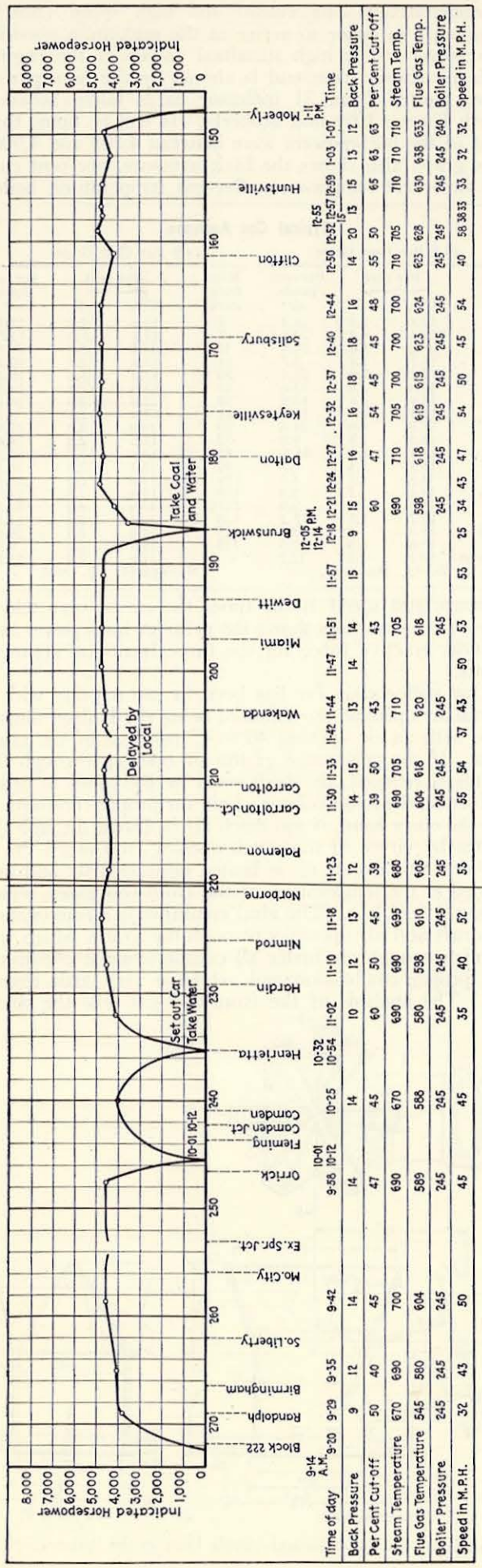
Typical Gas Analyses

10.8 Per Cent Grate				14.9 Per Cent Grate			
Miles from start	Per cent CO_2	Per cent O	Per cent excess air	Miles from start	Per cent CO_2	Per cent O	Per cent excess air
5	13.8	3.4	18.4	5	14.6	3.2	17.3
8	12.4	4.4	24.6	7	13.2	5.6	42.7
14	12.8	3.8	20.5	15	14.0	3.8	21.1
18	14.8	1.4	6.7	19	15.6	2.0	10.1
32	12.2	4.0	21.4	30	13.2	3.4	18.2
36	13.4	3.0	15.6	52	13.6	2.8	14.5
50	14.4	2.6	13.5	59	15.4	2.0	10.1
54	13.6	3.4	18.0	62	15.4	1.8	9.0
68	12.8	4.0	21.6	70	14.4	4.4	25.8
72	15.2	1.8	9.0	72	15.2	2.8	14.8
87	13.4	3.0	15.5	87	14.6	3.2	17.2
91	15.1	1.4	6.7	92	15.4	2.0	10.1
102	15.6	1.2	5.6	104	15.4	2.2	11.1
109½	14.6	1.7	8.4	108	15.4	2.8	14.9
120	14.4	1.8	9.0	117½	13.6	4.2	23.3
124	15.2	1.5	7.2	120	14.8	2.2	11.1
125½	15.7	1.1	5.3	125	15.2	2.0	10.0
127	15.8	1.5	7.3	127	15.0	1.2	5.7
Average...	14.2	2.5	12.7		14.6	2.9	15.3
	Bevier, Mo., coal.				Springfield, Ill., coal.		

Our policy thus far has been to use a grate with a liberal air opening, the standard being the Hulson finger-type with an air opening 40 to 45 per cent of the grate area. If the percentage of the air opening through the grates is reduced, the draft must be increased in order to furnish the same volume of air for proper combustion. On the other hand, if too much air is drawn through the grates by virtue of too much opening, too much draft, or both, this excess air is heated unnecessarily and discarded at the temperature of the front-end gases, which means a fuel loss. The ideal condition is a combination of draft and air openings through the grates which will furnish enough air under all except unusual conditions for proper combustion and yet have very little excess air. The analysis of the front-end gas tells the story.



Details of the Kiesel Exhaust Nozzle Used in the Wabash Tests



Profile of the Huntsville Hill on the Moberly Division of the Wabash

The standard locomotive with Hulson Tuyere-type grates, with 43-per cent air opening, using Central Illinois and Western Kentucky coal, showed low excess air, the average for seven readings being only 4.2 per cent and, while this covered only two trips, it indicates that the 43-per cent air opening was none too large and that if a reduced air-opening grate were used, there would not be enough air for proper combustion and a smoky and inefficient boiler would result.

Use of a restricted air-opening grate must carry with it a change in draft appliances, unless, of course, the locomotive is already drafted too heavily.

The gas analyses on the Kiesel front-end locomotives were made with 10.8-per cent and 14.9-per cent air-opening Hulson Tuyere-type grates, and with Missouri, Central Illinois and West Virginia coals. The West Virginia and the Missouri coals required more air per lb. of coal than the Illinois, and this seemed to have an effect on the excess air. The grates with 10.8-per cent air opening showed an average excess air for several trips of 13.4 per cent, but the excess air was apt to get too low if there was any flue-sheet clinker, or the fire was allowed to thicken. The 14.9-per cent grates showed 15.2 per cent excess air average, and had a little more margin against adverse conditions of the flues and fires. Inasmuch as these adverse conditions were usually controllable, not much margin of excess air is necessary, but it was decided to adopt the 14.9-per cent as best suited to this front-end arrangement. The CO_2 was fairly high in all cases, indicating good combustion, and the fire bed was usually in excellent condition with very little grate shaking required.

Conclusions

Increased Capacity.—Our tests showed that the class of locomotive involved can be expected to deliver from 25 to 30 per cent more horsepower when equipped with a Kiesel front end, and 14.9-per cent air opening grates than the engine with the standard front end and round hook-type exhaust tip. This increased capacity may be utilized by increasing the train tonnage for a given schedule, thus decreasing train-miles, or time may be made up on manifest train schedules with existing tonnage ratings.

Grates.—The stronger draft with the Kiesel style of front end and large stack necessitated a grate with air openings of such design and size as not to tear the fire, and also not wastefully furnish too much excess air. The Hulson Tuyere-type finger grate with 14.9-per cent air opening fulfilled this requirement nicely, delivering a sufficient volume of air in such a way as not to tear or lift the fire, and also allow very little loss to the pan. It may be that a still lower per cent of air opening will be advisable with locomotives using the Type-A superheater in connection with this type of front end.

Fuel Economy.—Decreased back pressure and increased temperature of superheat with the improved front end mean steam economy and decreased fuel consumption. On the other hand, if advantage is taken of the available increased capacity to run trains faster, heavier or both, the locomotive will necessarily be worked at longer cut-off, which is somewhat against steam economy; and the rate of coal consumption per sq. ft. of grate area per hr. will increase, which means reduction in boiler efficiency. A point will be reached beyond which the causes for increase in fuel will overbalance gain in economy through higher superheat and lower back pressure. At this point, we start to pay in fuel for increased speed and train tonnage, but these mean better on-time performance of heavier manifest freight trains and reduced transportation costs.

Claim Agents Meet at Chicago

Business improvement and Wagner compensation bill chief topics at forty-fourth annual convention

THE recent improvement in business, its continuation under the new railroad legislation and the Wagner compensation bill which, if passed, will more than treble the amount now paid by the railways in compensation for disability, were the chief topics discussed at the 44th annual convention of the Association of Railway Claim Agents at Chicago on June 21-23, H. L. Durham, general claim agent of the Chesapeake & Ohio, presiding.

The program, which was supervised by W. F. Every, general claim agent of the Northern Pacific, included addresses by selected speakers, papers on topics assigned to members, and committee reports. Addresses were made by Samuel O. Dunn, chairman of the board of the Simmons-Boardman Publishing Co., and editor of *Railway Age*; George M. Crowson, assistant to the senior vice-president of the Illinois Central; and Joe Marshall, special representative of the Freight Claim division of the American Railway Association. The topics discussed included "Hospital Liens—Their Effect Upon Claim Handling", by John S. Douglass, general claim agent of the Gulf, Colorado & Santa Fe; "A Lawyer's Impressions of Good Claim Agency", by Frederic D. McCarthy, assistant general counsel of the Northern Pacific; "Informal Talk" by Frank V. Whiting, general claims attorney of the New York Central; "The Tyranny of Precedent" by Smith R. Brittingham, assistant general solicitor of the Seaboard Air Line; "United States Supreme Court Decisions on Interstate Commerce" by Everett S. Stille, claim agent of the Washington Terminal Company; "The Value of Local Claim Conferences" by Parks C. Archer, general claim agent of the Alton; "Recent Tendencies in Workmen's Compensation" by Oliver G. Brown, assistant general claims attorney of the New York Central; and "Equality of Opportunity for Our Railroads" by J. J. Donahue, general claims attorney of the Louisville & Nashville.

Officers elected for the ensuing year are: President, Frank A. Hruska, chief claim agent of the New York Central; vice-presidents, Herbert A. Rowe, claims attorney of the Delaware, Lackawanna & Western; Parks C. Archer, general claim agent of the Alton; and F. D. Fauser, general claim agent of the Wabash; and secretary-treasurer, H. D. Morris, district claim agent of the Northern Pacific (re-elected). The next annual meeting will be held at Cleveland, Ohio, on a date to be fixed by the Executive committee.

Business Recovery

Mr. Dunn spoke on business recovery, contending that business has been improving for a longer period than most people realize. Improvement, he said, began at the beginning of last summer and has been much better since the bank moratorium. He supported his statements by carloading figures which in May exceeded those of the same month in 1932 and previous months in 1933. That the improvement in business, he continued, is better than carloading figures indicate is shown by the fact that railroad earnings in May will show an improvement over last year, while those of June will be astonishing. He further contended that the improvement now under way will not languish because of governmental policies since it is founded upon economic adjustments.

In discussing the new railroad legislation, he said that the purpose of railroad co-ordination is to reduce the legislation which for years has throttled the railways. The railways, he continued, could have eliminated much expense and have reduced rates prior to the appointment of the co-ordinator if it had not been for legislation. Under the new conditions, the work of the co-ordinator may have a lasting effect.

Mr. Dunham expressed the need for a closer relationship among claim agents in view of changing conditions. "Legislation," he said, "is being advocated which, if passed, will bring about revolutionary changes in what constitutes a great proportion of our work. In the changing complexion of the laws and conditions by which we are governed, we shall need more than ever the means of interchange of knowledge, thought and experience." This interchange of knowledge, he continued, is made possible by the Association of Railway Claim Agents, which, through its bulletin, card index and close association of members, familiarizes its members with the latest information on claim work.

A summary of various compensation acts was made by Frank V. Whiting, chairman of the Compensation Acts committee and general claims attorney of the New York Central. The tremendous cost of these acts, he said, is demonstrated by the compensation law in New York, which in two recent years exceeded $150,000,000. "During the last year," he continued, "there have been compensation bills introduced in Congress to cover employees engaged in interstate commerce. An estimate of the cost of compensation to be paid by the railroads under Wagner Bill 5-1320, which has extremely liberal provisions and which has no limitations other than a percentage limitation on the amount of the compensation, indicates that the cost will be 3½ times our present cost." In discussing Swanson Bill H.R.12170, he said, "Without reference to the obvious reasons for and disadvantages of a federal act applicable to employees engaged in interstate commerce only, it is our judgment that all employees in the transportation industry should be accorded the same remedies in connection with compensation. In other words, there is no reason why an employee engaged in interstate commerce should be given preference over his fellow employee who happens to be injured while engaged in intrastate commerce or as to such employees who are injured in industry within a state."

Hospital Liens

Mr. Douglass discussed the campaign of the American Hospital Association to have enacted by each state what is known as a Hospital Lien Law, the purpose of which is to reduce the enormous annual losses of the individual hospitals as the result of or growing out of the treatment of accidents or injury cases. According to Mr. Douglass, lien laws are the result of the automobile traffic situation and the hospitals are primarily directing their efforts to enhance the chances of collecting their charges in automobile accident cases.

"If the purpose and interest of the hospitals should be carried out in the enactment of these lien laws," he said, "it would be not only unjust to the railroads but

it would, in the end, prove a boomerang to the legitimate hospitals and, instead of correcting, would magnify the evils now complained of by them. Insofar as the railway companies are concerned, there exists no necessity for such a law. Ninety-five per cent of the hospital charges in Santa Fe injury cases are paid either directly or indirectly by the railroad.

"The proposed legislation, in substance, gives the hospital a lien upon all moneys paid by friendly adjustment, suit or otherwise, in settlement of personal injury claims growing out of liability accidents to the extent of hospital charges for services rendered such injured party. Since a large portion of railroad claims are settled out of court, the position of the railroad in regard to the law becomes important. The effectiveness of the lien or the protection to the hospital is dependent entirely upon the liability of the alleged wrongdoer. Therefore, will it not be contended by the hospital that a settlement of a claim by the railroad will carry with it prima facie evidence of liability?

"Who is going to judge how long a patient should remain in a hospital, or at what time he should be discharged; and who will be the judge of the fairness and correctness of the hospital charges? To illustrate, suppose that Bill Shivley is seriously and permanently injured in an accident of doubtful liability. When or at what length of time will the hospital charges in this instance be due? Will the company be expected to pay the hospital, as under the Texas laws, at the rate of $5 per day or $1,825 per year for the remainder of Bill's life? This proposed legislation does not limit the liability of the railroad company to such hospital to the amount paid in a friendly settlement, or to the amount recovered in a judgment."

Mr. Stille, in discussing United States court decisions on interstate commerce, said that one of the most troublesome questions which confronts claim men and railroad attorneys and even the courts themselves is when an employee of a common carrier by railroad is engaged in interstate commerce within the meaning of the Federal Employees' Liability Act. The question, he said, is an important one because when an employee is injured in the states the first question that presents itself is whether the case comes under federal or state law, as the case may only be governed by the federal law when the employee at the time of his injury was engaged in interstate commerce within the meaning of the act. He cited several cases to show how the courts have handled various suits.

Mr. Bowne described the trend in compensation laws as a cycle of law revisions in which the states having less stringent provisions are inclined to change their statutes to make them as broad as those of neighboring states. At present, he said, 43 states have compensation laws and 3 have none. The provisions of these laws vary from small weekly or death payments to the strict requirements of the New York law which provides for payments to widows, payments to children up to the age of 18 years, and life payments to the injured in case of disability.

He also spoke on the all-elusive occupational-disease provision of compensation laws whereby employees are compensated for disability following diseases that are contended to have been acquired as a result of the occupation. He discussed restrictions of the right of railroads to carry their own insurance, contending that the employees and the managements do not want an outside agency to handle claims, that no outside claim agency can handle claims with the employees as well as the railroad organization can, and that the cost to the railroads is much higher when the work is performed by outside agencies.

Grade Crossing Accidents Again Decrease

The Grade Crossing committee, of which Mr. Rowe is chairman, reported another decrease in the number of railroad-highway crossing accidents, fatalities and injuries throughout the nation for the calendar year, this being the fourth consecutive year of recession from the peak year of 1928, when 5,800 crossing accidents, 2,568 fatalities, and 6,667 injuries occurred. The record for 1932 he said, was 3,499 accidents, 1,525 fatalities, and 3,989 injuries. Automobile registration in 1932 was 23,493,124, a reduction of less than one-half per cent below the peak year 1928. Gasoline consumption, which may be regarded as a barometer of automobile use, was 15,853,026,000 gal. in 1932, an increase of 11 per cent over 1928. The mileage of car operation is greater per gallon of gasoline since the percentage of small cars has increased. More than 90 per cent of all crossing accidents involved automobiles.

In 1932 there was one railroad crossing fatality to every 709,623 locomotive-miles operated in the United States. A further and repeated reduction of 40 per cent in crossing fatalities and injuries is scarcely likely to again occur within the next five-year period. It may well be that, barring the enforcement of drastic action against reckless motor car operation, the minimum has been reached, that is one crossing fatality to every 16,000 automobiles registered. Motor car fatalities averaged one to every 826 motor vehicles registered.

A code of ethics adopted by the membership provides that the claim agent should use all lawful means to combat improper methods of all persons who resort to illegal or unethical practices in the assertion and prosecution of claims so that each claim may be justly determined; and sets up the cardinal principle of claim agency as the duty to seek the facts without being credulous.

The South African Railways and Harbors Administration for the year ending March 31, 1932, reported a deficit after all charges of £1,818,621 as compared with a net loss of £784,620 for the previous fiscal year ending March 31, 1931. From railway services alone the 1931-32 deficit was £1,212,386 as compared with one of £309,431 in 1930-31; gross revenues from railway operations declined from £26,951,120 in 1930-31 to £24,369,366 in 1931-32 but operating expenses have meanwhile been reduced to the point where, the report suggests, the prospective deficit for 1932-33 would be cut "almost to the vanishing point" if it were possible for the railways to obtain from the government treasury: (1) The benefit from the remission overseas of payments in sterling of interest on the railway portion of the external debt (£800,000); (b) the cancellation of the annual payment of 3½ per cent interest on some 13 million pounds paid by the railways for capital improvements out of pre-Union railway revenues upon which the treasury has no interest charges to meet (£459,000); (c) the difference between (1) the amount paid by the railways to the treasury as interest on pre-Union capital more than should be paid and (2) the interest on the cost of raising loans incurred by the treasury for the railways but not paid by the latter (£300,000). These matters of government policy the report mentions without criticism but it suggests at another point that "Critics of railway finance who advocate the appointment of special commissions to find ways and means of writing down railway capital accounts at the expense of the general taxpayer should endeavor to find ways and means of inducing Parliament to refund to the railways the money lost to the latter by the heavy overpayment of interest charges."

about by the inf
ments by insects
fective in fumig
of buildings or e
the work involv
which it can be

The Calcynat
the car, consists
fumigant hopper
of the hopper;
which surrounds
discharged into
of Calcyanide ha
into it through
110-volt, univer
passes through
fumigant in the
Filtering throug
proof bag, from
two hose outlets
gated.

A car to be t
sible, and then
alongside. The
are introduced i
dow or in the c
precaution neces
hose ends by at
tightly with pape
the window or d
out. Thus arran
the air out of the
then forces the
culation of the a
hour, during wh
for fumigation.
and outlet hoses
are plugged. T
for a period of
Calcynator can

Ventilating a

The Ca

A. S. T. M. Has Busy Week at Chicago

Thirty-sixth annual convention held at Hotel Stevens covered wide variety of subjects relating to materials and their properties

WITH a registration of some 750 members and guests at its thirty-sixth annual meeting, the American Society for Testing Materials added its quota to the large convention attendance at Chicago during the Engineering Week. The A. S. T. M. Convention was held at the Hotel Stevens from Monday, June 26, to Friday, June 29, inclusive, embracing 16 sessions in addition to a large number of committee meetings, but all of Wednesday was set aside for participation with the members of other engineering and scientific societies in the celebration of Engineers' Day at a Century of Progress Exposition.

Collaboration with other convention groups also took the form of a joint session with the American Foundrymen's Association for the presentation of a Symposium on Cast Iron, the third in a series to be sponsored by the two associations. In addition, the Edgar Marburg lecture was delivered by Dr. Herbert John Gough of the National Physical Laboratory, England, at a joint session with the Engineering section of the American Association for the Advancement of Science. The Charles B. Dudley medal was awarded to Samuel Epstein, metallurgist, Battelle Memorial Institute, for his paper on the Embrittlement of Hot-Galvanized Structural Steel, presented at the convention in 1932.

As was the case when the association met at Chicago two years ago, an exhibit of testing apparatus and equipment was presented in the exhibition hall of the hotel. The convention was conducted under the direction of President Cloyd M. Chapman, consulting engineer, New York, assisted by C. L. Warwick, secretary, as well as by those who presided over the various sectional meetings. In the election of officers, Professor T. R. Lawson, head of the civil engineering department, Rensselaer Polytechnic Institute, Troy, N. Y., was chosen president, and Dr. Hermann von Schrenk, consulting timber engineer, St. Louis, Mo., was elected vice-president.

Discuss Significance of Tests

As in past years, much of the convention program was occupied in the routine disposal of committee reports having to do with the results obtained in various testing projects, and the submission of new specifications for materials and for methods of testing materials for publication as "Tentative Standards" and for the advancement of "Tentative Standard Specifications" to "Standard." However, a considerable part of the convention time was devoted to papers reviewing current advances in those physical sciences that have a direct bearing on the properties of materials and the methods of their investigation. Of even greater significance is the attention given to the interpretation of tests or to endeavors to measure the relation between the results of tests and the true properties of the product from which the test specimens were taken.

The Joint Research Committee on the Effect of Temperature on the Properties of Metal, brought into being by the increased use of high-pressure boilers and the growth of industrial processes involving the application of stress to metals at high temperature, submitted tentative specifications for short time and long time (creep) high temperature tension tests of metallic materials. In addition, the committee's report included three discussions of the behavior of metals in tension tests under various temperatures and of the interpretation and significance of such tests.

One session was devoted to the fatigue of metals, methods of testing and metallography. A method for making accelerated tests for the fatigue limit of metals was explained in a paper by Professor H. F. Moore and H. B. Wichart of the University of Illinois, with the title "An Overnight Test for Determining Endurance Limit." The procedure is based on the theory that below the endurance limit of the particular metal, cycles of repeated flexure increase the endurance limit and presumably the tensile strength, while above the endurance limit cracks begin to develop and will reduce the tensile strength. A period of 1,400,000 cycles of flexure, which can be obtained in 15½ hours in a machine running at 1500 r.p.m., appears to be sufficient to develop such cracks in the metals tested with the possible exception of duralumin. Accordingly, the procedure is to start the test late in the afternoon and remove the specimens the following morning, and subject them to a tensile test in order to determine any variations in the tensile strength.

Reports on Ferrous Metals

The Committee on Steel submitted and recommended for publication as tentative standards Specifications for Heat-Treated Carbon Steel Elliptical Springs for Railway Equipment, Specifications for Alloy Steel Castings for Structural Purposes, and Specifications for Lap-Welded and Seamless Steel Pipe for High Temperature Service. It offered a new clause covering rolled base plates to be inserted in the Standard Specifications for Structural Steel for Bridges and for Structural Steel for Buildings, in addition to changes in certain other standards, while the list of tentative revisions of specifications recommended for advance from tentative to standard includes those covering low carbon steel splice bars, quenched carbon steel track bolts, quenched alloy steel track bolts, steel screw spikes, low carbon steel track bolts, steel tie plates, structural steel for buildings, structural silicon steel and steel reinforcement bars. Tentative specifications covering soft steel track spikes, structural steel rivets, lap-welded and seamless steel and lap-welded boiler tubes were recommended for adoption as standard.

The definition of double-refined iron, offered by the Committee on Wrought Iron in 1931 to replace an

Centralized Traffic Control on P. R. R.

Latest type of signaling used for new line and junctions connecting with new Cincinnati passenger terminal

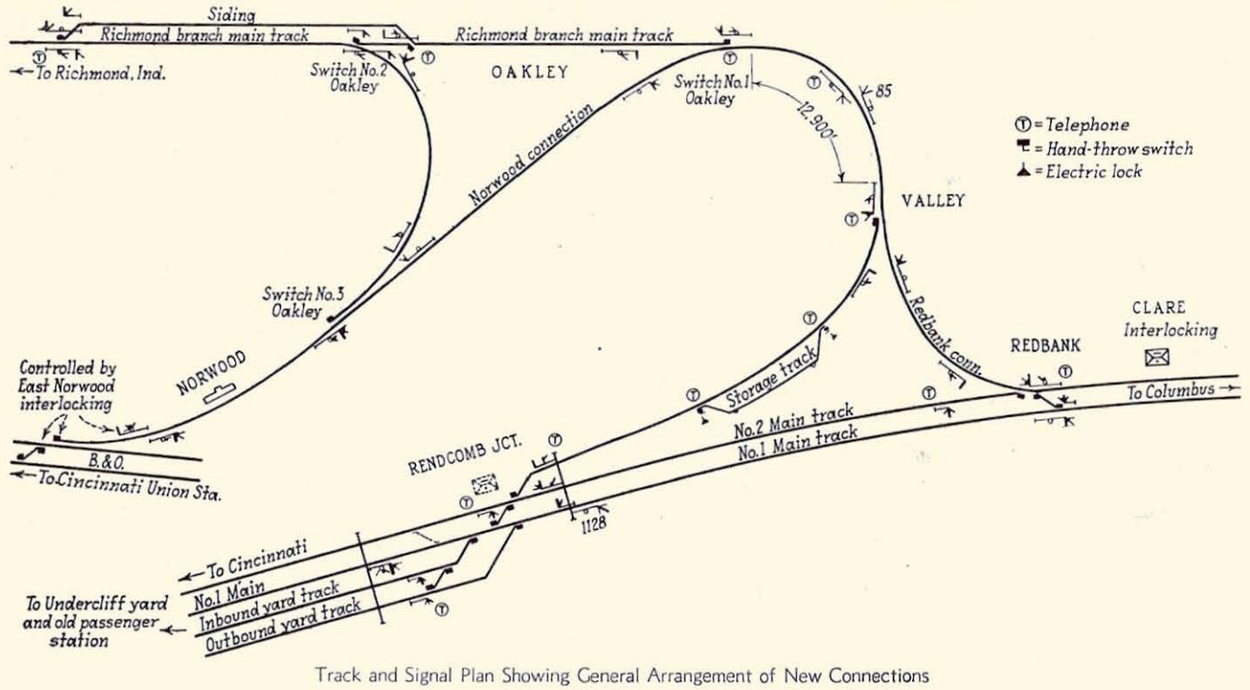
The Switch Points Are 45 Ft. Long

IN order to route passenger trains into and out of the new passenger station of the Cincinnati Union Terminal Company, the Pennsylvania built 1.2 miles of line to connect with the Baltimore & Ohio at Norwood Junction, between which point and the new station, a distance of 8.75 miles, Pennsylvania trains operate over the B. & O. main line. The main line of the Pennsylvania from Columbus, Ohio, and the east, follows the Miami river and the north bank of the Ohio river for 10 miles between Clare and the old Cincinnati passenger station at Pearl and Butler streets. The main line from Chicago, via Richmond, Ind., passes east of the city and joins the other line at Rendcomb Junction. As the new Union station is located west of the main business section of the city, the Pennsylvania had no connection to this station.

In order to establish such a connection, a new single-track line, 1.2 miles long, was built from a point on the Richmond line, to Norwood Junction, where connection is made with the Baltimore & Ohio, this junction being included in an existing electric interlocking at that point. A wye connection was built so that trains could be routed in either direction. Passenger trains between Chicago and the new Union station are routed via Norwood Junction and around one leg of the wye at Oakley on to the main line. A new single-track connection 0.5 mile long was built from Valley, on the old Richmond line, to Red Bank, on the Columbus-Cincinnati line, thus forming a new junction at this point. Passenger trains running between Columbus and Cincinnati are now routed via this new connection to Valley, thence over the old Richmond line and the right leg of the wye at Oakley to Norwood, and thence to the B. & O. and into the station.

Line Constructed for High-Speed Operation

The new line and connections are constructed for high-speed operation. Except in the left leg of the wye at Oakley, the rail is 131-lb. The turnouts are provided with either No. 15 or No. 20 frogs, and with 45-ft. switch points at No. 3 switch, Oakley, at the turnout at Valley, and at the turnout and cross-over at Red Bank.



Track and Signal Plan Showing General Arrangement of New Connections

A. S. T. M. Has Busy Week at Chicago

Thirty-sixth annual convention held at Hotel Stevens covered wide variety of subjects relating to materials and their properties

WITH a registration of some 750 members and guests at its thirty-sixth annual meeting, the American Society for Testing Materials added its quota to the large convention attendance at Chicago during the Engineering Week. The A. S. T. M. Convention was held at the Hotel Stevens from Monday, June 26, to Friday, June 29, inclusive, embracing 16 sessions in addition to a large number of committee meetings, but all of Wednesday was set aside for participation with the members of other engineering and scientific societies in the celebration of Engineers' Day at a Century of Progress Exposition.

Collaboration with other convention groups also took the form of a joint session with the American Foundrymen's Association for the presentation of a Symposium on Cast Iron, the third in a series to be sponsored by the two associations. In addition, the Edgar Marburg lecture was delivered by Dr. Herbert John Gough of the National Physical Laboratory, England, at a joint session with the Engineering section of the American Association for the Advancement of Science. The Charles B. Dudley medal was awarded to Samuel Epstein, metallurgist, Battelle Memorial Institute, for his paper on the Embrittlement of Hot-Galvanized Structural Steel, presented at the convention in 1932.

As was the case when the association met at Chicago two years ago, an exhibit of testing apparatus and equipment was presented in the exhibition hall of the hotel. The convention was conducted under the direction of President Cloyd M. Chapman, consulting engineer, New York, assisted by C. L. Warwick, secretary, as well as by those who presided over the various sectional meetings. In the election of officers, Professor T. R. Lawson, head of the civil engineering department, Rensselaer Polytechnic Institute, Troy, N. Y., was chosen president, and Dr. Hermann von Schrenk, consulting timber engineer, St. Louis, Mo., was elected vice-president.

Discuss Significance of Tests

As in past years, much of the convention program was occupied in the routine disposal of committee reports having to do with the results obtained in various testing projects, and the submission of new specifications for materials and for methods of testing materials for publication as "Tentative Standards" and for the advancement of "Tentative Standard Specifications" to "Standard." However, a considerable part of the convention time was devoted to papers reviewing current advances in those physical sciences that have a direct bearing on the properties of materials and the methods of their investigation. Of even greater significance is the attention given to the interpretation of tests or to endeavors to measure the relation between the results of tests and the true properties of the product from which the test specimens were taken.

The Joint Research Committee on the Effect of Temperature on the Properties of Metal, brought into being by the increased use of high-pressure boilers and the growth of industrial processes involving the application of stress to metals at high temperature, submitted tentative specifications for short time and long time (creep) high temperature tension tests of metallic materials. In addition, the committee's report included three discussions of the behavior of metals in tension tests under various temperatures and of the interpretation and significance of such tests.

One session was devoted to the fatigue of metals, methods of testing and metallography. A method for making accelerated tests for the fatigue limit of metals was explained in a paper by Professor H. F. Moore and H. B. Wichart of the University of Illinois, with the title "An Overnight Test for Determining Endurance Limit." The procedure is based on the theory that below the endurance limit of the particular metal, cycles of repeated flexure increase the endurance limit and presumably the tensile strength, while above the endurance limit cracks begin to develop and will reduce the tensile strength. A period of 1,400,000 cycles of flexure, which can be obtained in 15½ hours in a machine running at 1500 r.p.m., appears to be sufficient to develop such cracks in the metals tested with the possible exception of duralumin. Accordingly, the procedure is to start the test late in the afternoon and remove the specimens the following morning, and subject them to a tensile test in order to determine any variations in the tensile strength.

Reports on Ferrous Metals

The Committee on Steel submitted and recommended for publication as tentative standards Specifications for Heat-Treated Carbon Steel Elliptical Springs for Railway Equipment, Specifications for Alloy Steel Castings for Structural Purposes, and Specifications for Lap-Welded and Seamless Steel Pipe for High Temperature Service. It offered a new clause covering rolled base plates to be inserted in the Standard Specifications for Structural Steel for Bridges and for Structural Steel for Buildings, in addition to changes in certain other standards, while the list of tentative revisions of specifications recommended for advance from tentative to standard includes those covering low carbon steel splice bars, quenched carbon steel track bolts, quenched alloy steel track bolts, steel screw spikes, low carbon steel track bolts, steel tie plates, structural steel for buildings, structural silicon steel and steel reinforcement bars. Tentative specifications covering soft steel track spikes, structural steel rivets, lap-welded and seamless steel and lap-welded boiler tubes were recommended for adoption as standard.

The definition of double-refined iron, offered by the Committee on Wrought Iron in 1931 to replace an

earlier definition, was recommended for advancement to standard. The definition is as follows:

Double-Refined Iron.—Iron to be classed as double refined shall be all new wrought, which shall be first rolled into muck bars. These bars shall then be twice piled and rerolled. All iron shall be free from steel and from foreign scrap. The manufacturer may use his own mill products of at least equal quality, but only in the first piling. In the final piling all bars shall be of the full length of the pile.

The committee also submitted Specifications for Wrought Iron Rivets for advance to standard, as well as revision of a number of other specifications.

The Committee on Corrosion of Iron and Steel submitted specifications for advance from tentative standard to standard covering Zinc Coated (Galvanized) Iron and Steel Telephone or Telegraph Wires, Zinc Coated (Galvanized Iron or Steel Tie Wires, Zinc Coated (Galvanized) Iron or Steel Wire Strand (Cable), and Zinc Coated Iron or Steel Chain Link Fence Fabric Galvanized After Weaving. Progress reports on various exposure tests were also presented, among which one, covering the total immersion of 22-gage sheets in sea water at Key West, Fla., was completed on August 12, 1932, with the failure of all specimens. A tabular statement accompanying the report showed an average life of 1250.5 days for 18 specimens of non-copper-bearing pure iron and 1419.5 days for 18 specimens of copper-bearing pure iron, compared with 1082.0 days for 39 specimens of copper-bearing open hearth steel, the material showing the next highest average life. The committee, however, adhered to its previous decision that no official conclusion should be drawn until the completion of the tests on 16-gage specimens, of which only 35 failures have been recorded to date out of 138 specimens.

Timber and Timber Preservation

The report of the Committee on Timber was concerned primarily with co-operative work carried on with committees of the American Railway Engineering Association and the American Wood-Preservers' Association, and it recommended appropriate action on the part of the A. S. T. M. in conformity with action previously taken by the last conventions of the other two associations. Specifically, it proposed the revision of Standard Specifications for Structural Wood Joists and Planks, Beams and Stringers and Posts and Timbers, with respect to the designation of sizes, as adopted by the A. R. E. A. in March. Similar action was recommended with respect to revisions of the methods of sampling and analysis of creosote oil and of the methods of test for distillation of creosote oil, both of which have been adopted by the A. R. E. A. and the A. W. P. A. The committee also recommended for advancement from tentative standard to standard definitions of terms relating to Timber Preservative, adopted by the A. W. P. A. in February, and a volume and specific gravity correction table for creosote, creosote coal-tar solution and coal-tar already adopted by both the A. W. P. A. and the A. R. E. A.

Cement Actively Discussed

Progress was reported by the Committee on Cement on the study being made of a proposed plastic mortar compression test of high-early-strength cement, and on the investigation of the effects of a varying content of silicon trioxide on a number of cements of different content of tricalcium aluminate. The committee recommended that the Tentative Specification for High-Early-Strength Cement be adopted as standard.

The general problem of specifications for Portland cement with particular reference to recent questions raised concerning the influence of variations in chemical content as effecting high-early-strength, high temperatures during hardening and other properties, was discussed in a paper by P. H. Bates, chairman of the committee and chief of the clay and silicate division on U. S. Bureau of Standards, Washington, D. C. In his opinion there is need for several cements for the many different uses to which cement is put, namely, "high-early-strength cements, plastic cement, those of low heat of hardening, those having low volume changes, those offering resistance to moisture and aggressive solutions, and at least two of somewhat the nature of our present standard cements, one of them being lower in lime and higher in silica than the other."

Concrete and Brick Masonry

The session allotted to concrete was devoted largely to a discussion of the significance of tests for the characteristics of concrete and of concrete aggregates, led by A. N. Talbot, professor emeritus, University of Illinois. Bearing on this same subject was a paper by H. R. Nettles and J. M. Holmes, Lehigh University, on a study of the analysis of fresh concrete for the determination of the variations of the actual mix from the proportions presumed to have been made at the mixer. This study has a timely interest because the rapid growth of the business of selling ready-mixed concrete in nearly every large city has given rise to a demand for a specification for this product, which has now been met by the Committee on Concrete and Concrete Aggregates in submitting Specifications for Ready-Mixed Concrete for publication as a tentative standard. Another product of this committee's efforts, a Tentative Specification for Light Weight Aggregates, embracing such material as burned shale or clay, tuff, pumice and slag, was withdrawn just prior to the presentation of the report.

Recognition was accorded the active interest now manifest in the reinforcement of brick masonry in a paper by M. O. Withey, professor of mechanics, University of Wisconsin, on Tests of Brick Masonry Beams, which show that it is possible to develop a high degree of flexural strength in such construction. The tests indicate also that the formulas used in the calculation of stresses in reinforced concrete beams can be applied with proper constants, but point to the need of high grade workmanship and to the opportunity for developing improvements in design and details. The Committee on Hollow Building Units presented revisions of specifications for three classes of structural clay tile for publication as tentative specifications.

A Safe Car Fumigator

TO meet the needs of the railways for a safe and positive means of fumigating freight cars, diners and camp cars, and, in fact, any type of car or building infested with insects or rodents of any character, the Calcyanide Company, New York, has developed a self-contained fumigator, called the Calcynator, which insures a positive kill, and without the necessity of the operator entering the area being fumigated after it has been prepared for fumigation. The new fumigator has been designed especially to meet a need in the use of Railroad Calcyanide, a powder which releases hydrocyanic acid gas upon exposure to the air, in the fumigating of empty or loaded freight cars to minimize damage claims brought

about by the infestation, or alleged infestation, of shipments by insects or rodents. It is, however, equally effective in fumigating dining or other cars, and all types of buildings or enclosed areas, and in all cases simplifies the work involved and adds further to the safety with which it can be carried out.

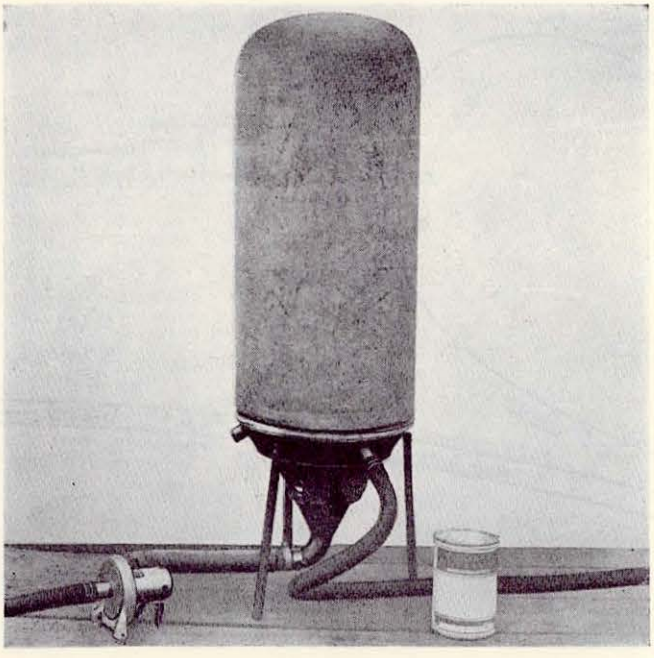
Details of the Calcynator

The Calcynator, which functions entirely outside of the car, consists essentially of a two-part, conical-shaped fumigant hopper; a fumigant filter bag mounted on top of the hopper; and an outside, gas-proof rubber bag, which surrounds the filter bag and collects the gas to be discharged into the area being treated. After a charge of Calcyanide has been placed in the hopper, air is forced into it through an inlet hose which is equipped with a 110-volt, universal motor-driven blower. As the air passes through the hopper, it completely aerates the fumigant in the filter bag, which becomes fully inflated. Filtering through this bag, the gas inflates the outer, gas-proof bag, from which it is drawn off through one or two hose outlets and directed into the area being fumigated.

A car to be treated is first made as air tight as possible, and then the Calcynator is charged and set up alongside. The free ends of the inlet and outlet hose are introduced into the car, either at the base of a window or in the crack of a partly closed door, the only precaution necessary in this regard being to separate the hose ends by at least two or three feet, and to stuff up tightly with paper or rags any unfilled opening or crack at the window or door, which would permit the gas to leak out. Thus arranged, the blower is turned on. This draws the air out of the car, passes it through the fumigant, and then forces the gas generated into the car. This recirculation of the air in the car is permitted for about one hour, during which time the next car can be made ready for fumigation. The blower is then turned off, the inlet and outlet hoses are withdrawn and the holes resulting are plugged. The gas is permitted to remain in the car for a period of about four hours, during which time the Calcynator can be used in fumigating other cars.

Ventilating a car after fumigation is effected readily by opening doors from the outside, assisted, if desired, by sucking the gas out by means of the blower attachment of the Calcynator. Ventilation requires from 30 to 40 min.

It is said that Calcyanide used in the Calcynator kills all forms of adult insects, larvae, pupae and eggs, and has such penetrating power that little or no attention need be given to adjusting any shipments or furnishings in cars fumigated. It is held to be most effective in destroying all forms of life in cars to be loaded with foodstuffs, furniture, woolen goods, etc., and it is stated that the gas will not damage clothing, upholstery, paint, woodwork, metals, foodstuffs or other substances or materials.



The Calcynator Inflated, as When in Action

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended June 24 amounted to 604,668 cars, an increase of 16,737 cars as compared with the preceding week and of 105,675 cars as compared with the corresponding week of last year. As compared with 1931 this was a decrease of 154,695 cars but last year the 600,000-car line was not crossed until Fall. Loading of all commodities showed increases as compared with the preceding week and all except merchandise, l.c.l., showed increases as compared with last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, June 24, 1933

Districts	1933	1932	1931
Eastern	141,471	112,627	168,994
Allegheny	122,186	95,895	147,719
Pocahontas	43,262	30,739	48,354
Southern	87,562	73,984	108,837
Northwestern	74,812	60,229	103,887
Central Western	83,567	80,156	117,394
Southwestern	51,808	45,363	64,178
Total Western Districts	210,187	185,748	285,459
Total All Roads	604,668	498,993	759,363
Commodities			
Grain and Grain Products	38,341	27,610	41,869
Live Stock	15,533	14,628	18,776
Coal	102,015	68,255	119,005
Coke	5,646	2,948	5,079
Forest Products	27,733	16,609	30,536
Ore	13,532	4,573	30,152
Mdse. L. C. L.	169,902	174,367	216,060
Miscellaneous	231,966	190,003	297,836
June 24	604,668	498,993	759,363
June 17	587,931	518,398	739,094
June 10	564,546	501,685	732,409
June 3	508,234	447,412	761,084
May 27	541,309	521,249	711,249
Cumulative total, 25 weeks	12,607,644	13,619,539	18,352,855

Car Loading in Canada

Car loadings in Canada for the week ended June 24 totaled 39,827. This was a decrease from the previous week of 744 cars and the index number was reduced from 64.71 to 62.97

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
June 24, 1933	39,827	19,688
June 17, 1933	40,571	19,283
June 10, 1933	40,824	18,624
June 25, 1932	39,302	16,943
Cumulative Totals for Canada:		
June 24, 1933	865,576	439,659
June 25, 1932	1,040,574	513,080
June 20, 1931	1,208,542	690,358

Centralized Traffic Control on P. R. R.

The Switch Points Are 45 Ft. Long

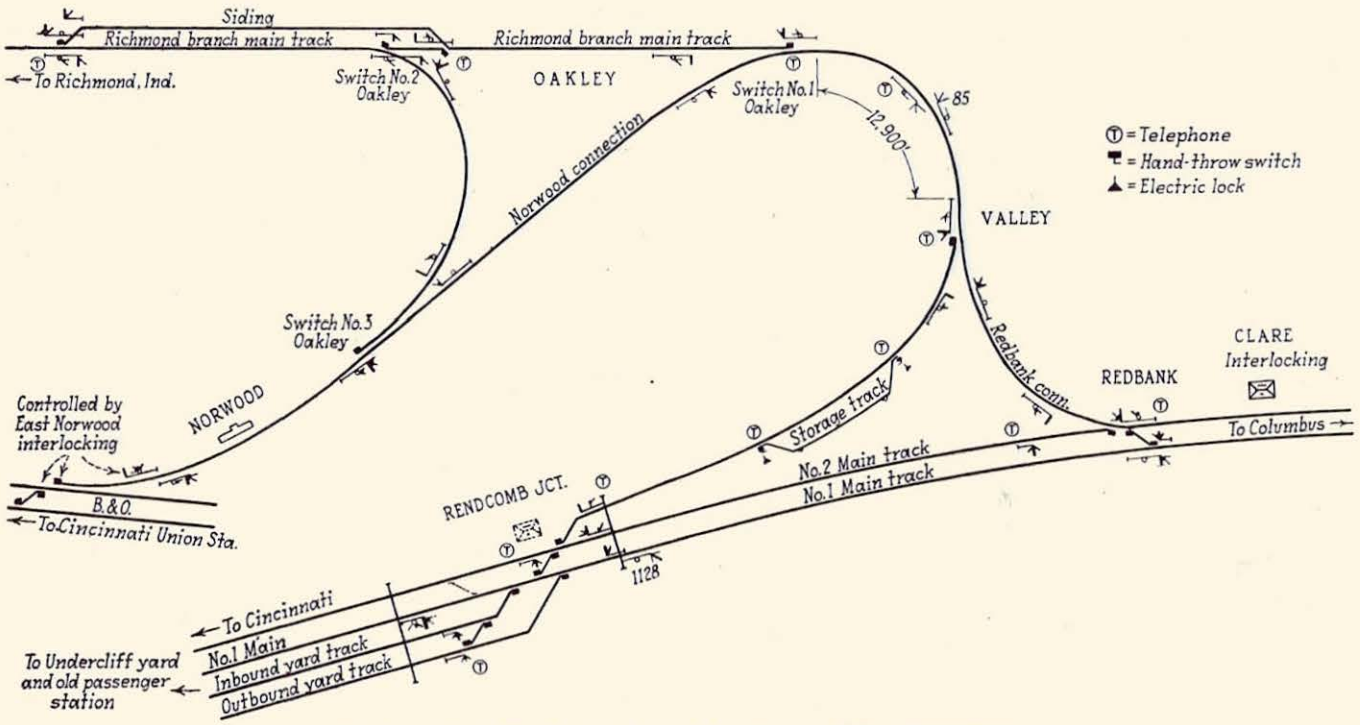
Latest type of signaling used for new line and junctions connecting with new Cincinnati passenger terminal

IN order to route passenger trains into and out of the new passenger station of the Cincinnati Union Terminal Company, the Pennsylvania built 1.2 miles of line to connect with the Baltimore & Ohio at Norwood Junction, between which point and the new station, a distance of 8.75 miles, Pennsylvania trains operate over the B. & O. main line. The main line of the Pennsylvania from Columbus, Ohio, and the east, follows the Miami river and the north bank of the Ohio river for 10 miles between Clare and the old Cincinnati passenger station at Pearl and Butler streets. The main line from Chicago, via Richmond, Ind., passes east of the city and joins the other line at Rendcomb Junction. As the new Union station is located west of the main business section of the city, the Pennsylvania had no connection to this station.

In order to establish such a connection, a new single-track line, 1.2 miles long, was built from a point on the Richmond line, to Norwood Junction, where connection is made with the Baltimore & Ohio, this junction being included in an existing electric interlocking at that point. A wye connection was built so that trains could be routed in either direction. Passenger trains between Chicago and the new Union station are routed via Norwood Junction and around one leg of the wye at Oakley on to the main line. A new single-track connection 0.5 mile long was built from Valley, on the old Richmond line, to Red Bank, on the Columbus-Cincinnati line, thus forming a new junction at this point. Passenger trains running between Columbus and Cincinnati are now routed via this new connection to Valley, thence over the old Richmond line and the right leg of the wye at Oakley to Norwood, and thence to the B. & O. and into the station.

Line Constructed for High-Speed Operation

The new line and connections are constructed for high-speed operation. Except in the left leg of the wye at Oakley, the rail is 131-lb. The turnouts are provided with either No. 15 or No. 20 frogs, and with 45-ft. switch points at No. 3 switch, Oakley, at the turnout at Valley, and at the turnout and cross-over at Red Bank.



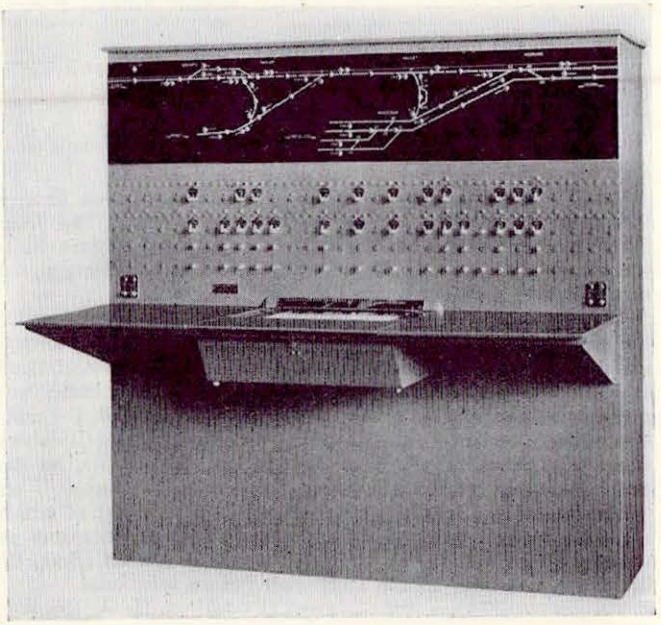
Track and Signal Plan Showing General Arrangement of New Connections

If ordinary interlockings had been installed at these widely separated junctions, in all probability several new plants, with their attendants on each trick, would have been necessary; furthermore, train delays would probably have been experienced because of confusion in issuing instructions to so many towermen. The problem was solved by installing a modern centralized-traffic-control system to operate all the switches, signals and electric locks in this territory. This system provides for the direction of train movements by signal indication throughout the entire area. The mechanical interlocking plant at Rendcomb Junction was abandoned and all the facilities at that point, with the exception of one crossover, became a part of the C. T. C. layout. To further expedite movements on the double track between Rendcomb Junction and Clare, signaling is arranged for trains to move by signal indication in either direction on either track, whereas previously single-direction operation only was afforded in this territory. The control machine for the entire C. T. C. layout is concentrated in a centralized machine located in the tower of the mechanical interlocking at Clare, 1.2 miles east of Red Bank, the signalman at this plant handling the new machine in connection with his former duties. The installation of this system dispensed with the services of three signalmen at Rendcomb Junction.

The Control Machine

The Union Switch & Signal Company's two-wire time-code system of centralized traffic control is used. The control machine in the tower at Clare has 12 levers for switches and 11 levers for signals. Two levers are provided in the machine for the control of the electric switch locks, together with spare spaces for 19 switch levers and 19 signal levers to allow for future development.

The illuminated track diagram above the levers on the control machine has a lamp in each section representing a track circuit, which is lighted when the corresponding section of track is occupied by a train. Likewise, each signal, switch and electric lock is represented on the diagram by a lamp. Hence, the signalman has a complete picture of the entire C. T. C. layout before him. In addition, all train movements in this territory are recorded by an automatic traingraph located in the desk which forms a part of the machine. This traingraph has 10 pens to record the passing of trains at an equal number of points on the track layout.



The C. T. C. Control Machine Is Located in the Clare Tower

Outside Construction

The signals used on this installation are of the position-light type, a total of 25 high signals and 8 dwarf signals being included in this territory. The use of 45-ft. switch points introduced a new problem in the operation of switches. In order to be assured that the point had completed its movement throughout its entire length, a pipe connection with cranks was extended from the operating rod back to a second operating rod attached to the switch 22.5 ft. from the point. This arrangement assists in throwing the entire length of the switch points as a unit, without springing the points. The position of the switch at the points is, of course, checked by the point detector which is a part of the switch machine. In order to check the position of the middle of the switch point, an extra circuit controller is connected to a switch foot attached to the right-hand switch point 22.5 ft. from the point.

This installation was designed and installed by signal-department forces of the Pennsylvania.

New Books...

Early Days of Modern Civil Engineering, by Richard S. Kirby and Philip G. Laurson. 324 pages, illustrated, 6 in., by 9 in. Bound in cloth. Published by Yale University Press, New Haven, Conn. Price, $4.

As a rule engineering schools give little attention to the history of the various subjects included in their courses of study. It is doubtful, therefore, whether many engineers realize that geodetic surveying, or the location of points on the earth by astronomical observations, is as old or older than land surveying. This is among the interesting facts brought out in the chapter on Surveying, in Early Days of Modern Civil Engineering. Other chapters deal in turn with Railways, Roads, Canals, Bridges, Tunnels, etc., including a chapter on Materials and one devoted to brief biographical synopses of famous engineers. It goes without saying, that to cover a subject as broad as that presented in the book, it must be abridged to confine it to 324 pages; but the material seems to have been selected with discrimination, and as the text is liberally documented, the reader is afforded plenty of references to other works on any subject in which he may have some special interest. The illustrations are attractive and well chosen.

The Order of Railroad Telegraphers, by Archibald M. McIsaac, Ph.D. 284 pages. 6 in. by 9 in. Cloth. Published by Princeton University Press, Princeton, N. J. Price, $2.50. (Also Oxford University Press, London.)

This is an elaborate study in trade unionism and collective bargaining, and the author is assistant professor of economics in Princeton University. He has made himself thoroughly acquainted with his subject and apparently has answered every possible question that any reader could think of. He goes back to 1882 and devotes his first 25 pages to the formative years. The high points of the brotherhood's history are clearly set forth.

He gives the union credit for having well satisfied its constituency through a career of 40 years. Wages and working conditions would no doubt have improved, any way, but the brotherhood may be assumed to have hastened the process. Also, the leaders have undoubtedly been constantly useful in promoting satisfactory seniority rules and other vital details. And the railroads have been reasonable in their dealings, because these employees have been fairly reasonable in the methods of bargaining that they have proposed. The author thinks that the telegraphers have given other labor unions valuable lessons on how to unionize "semi-white-collar" workers who are scattered all over the country and who are engaged in greatly diversified work.

Communications . . .

Advocates National Bureau of Railroad Research

WASHINGTON, D. C.

TO THE EDITOR:

At page 722 of your *Railway Age* of May 20, there appears an editorial on "Railroad Research". As I, doubtless, am the originator of the "criticism" which is referred to, it might be of considerable interest to you to know that many nationally known railroad officials recognize the pertinency of my remarks, which you term "criticism", and agree fully with the necessity for an adequate research department supported by all the railroads.

I have been assured by men responsible for the operation of railroads that my small contribution has done precisely what is suggested in the last sentence of your editorial.

Due to my long connection with railroad work, my wide acquaintance and many friends in railroad circles, I have never thought of engaging in destructive criticism of commendable efforts of individual railroads; however, for a number of years my duties required that construction contracts and specifications, together with records of purchases relating to all railroads passed before me and it was impossible to keep from seeing the wide differences in the rules, methods and practices in vogue, as well as the unwarranted waste in money. Being trained in railroad work, the cause of these inconsistencies was of interest to me. The tremendous possibilities of saving in operating expenses by following some systematic and standardized way of doing things nationally was evident. I am firmly convinced that a national bureau of research will sooner or later be created, supported by all the railroads with funds adequate to conduct the necessary investigations for the purpose of furnishing uniform advice to these officials regarding such matters. There is an urgent necessity for such work. You could be of tremendous value in bringing such a research department into being.

The necessity for it is proven conclusively in nearly any issue of the *Railway Age*. I call your attention to a most interesting article in the issue of May 20, beginning at page 734, entitled "How About the Crosstie Problem?" You will find therein food for thought along the line of standardization which I have been advocating. Particularly is the lack of it criticised on page 735 under the caption "Is Standard Boring for Ties Practicable", wherein you will note, "In the long run, all producer costs must be borne by the purchaser". I will not comment further on that report except to quote, "No two railroads specify the same pattern, even for identical rail sections, cant of tie plates, etc., with the result that if a producer makes ties without orders and it becomes necessary to treat such ties, they must be either treated without boring, or bored to some template which will very likely be unsatisfactory to later prospective buyers". I also call your attention to comments on specifications and sizes, that there is no uniformity, no national standard. The necessity for such things I am sure you appreciate.

If you will secure from your local telephone company copies of the American Telephone and Telegraph Company's specifications, which are the fundamental guides used by all its officers and employees, consisting of four large loose leaf volumes, one of which is called Accounting Circular No. 3, you will find therein what can be done in the way of standardizing rules, methods, practices, and materials suitable for a large business. There is no material used in the telephone business which is not of a definite standard whether that material happens to be used in California or Maine. If you will look those specifications over you will see that even the posture of the man who is doing the work is shown and the precise method of performing each function in connection with the work definitely outlined, so that no matter where telephone service is used it is rendered through plants of uniform specifications.

Those specifications were not possible except through a research department which devotes its entire time and attention to the technical problems of operating a telephone company. The almost perfect service, the sound financial condition of the various companies, and their public relations testify to the propriety of establishing similar standards for the railroads, with the omission of any features not in the public interest.

In conclusion, I will say, in your own language, that if I, "who have been so busy criticizing the railroads for insufficient research have done the roads a service by opening the eyes of railroads to their own accomplishments in scientific pursuits and emphasizing the importance of such activities", am successful eventually in getting them to establish some working organization which devotes its entire time and attention to establishing uniform specifications, rules, methods, practices, etc., on railroads, I will have been fully repaid for the small voluntary effort which I have been making during the last several years. If you are interested in those efforts, I will be glad to furnish you with a wealth of detail which tends to support my views. In my opinion, railroads can effect annual savings through standardization aggregating at least $100,000,000; other better informed railroad officials put the figure much higher.

R. E. ELGEN,
Vice-Chairman, Public Utilities Commission
of the District of Columbia

Is Heavy Rail the Answer?

CHICAGO

TO THE EDITOR:

The trend toward the use of heavier rails, discussed editorially in the *Railway Age* for April 29, suggests very properly that it may have economic limits. Basically, heavier rails are required because of the greater beam strength needed to distribute the heavier wheel loads.

Sufficient strength to carry imposed loads is, of course, the genesis of all engineering design but it is a question whether or not the use of heavier and still heavier rails is the best direction to go in achieving adequate strength in a track assembly.

The Special Committee on Stresses in Track of the A. R. E. A. has repeatedly shown that the maximum fiber stress in rails increases with their weight, that is, with their depth. There is also an investigation under way to determine the cause of transverse fissures in rails. Whether these defects have their primary origin in the processes of manufacture or in the stresses induced by traffic, or both, the remedy for them may be found to be related to the size and/or shape of the rails. In that event, an economic set-up may require that the weight of rails be reduced and instead the strength of the entire track assembly be increased all the way down to the subgrade.

A. C. IRWIN,
Manager Railways Bureau
Portland Cement Association

Safety Exhibit at Chicago

NEW YORK CITY

TO THE EDITOR:

In the June 3 issue of *Railway Age*, page 811, you have a little note on World's Fair matters to the effect: "The Joint Committee on Grade Crossing Protection of the American Railway Association is exhibiting a standard highway crossing signal in the Travel and Transport Building."

This is slightly in error in that the exhibit is displayed under the auspices of the Committee on Prevention of Highway Crossing Accidents, Safety Section, American Railway Association: which committee is also responsible for the illuminated announcement over the door west of entrance No. 7, T & T Building, where there is illustrated the slogan Cross Crossings Cautiously, American Railway Association. In addition, on the second floor of the same building, there is an exhibition of an enlarged Careful Crossing Campaign poster, the scenery of which is in colors, and part of the automobile and its occupants in silhouette in front of the scenery, so that it has an effect, by illumination, similar to the large sign before mentioned.

H. A. ROWE.

Odds and Ends . . .

Praise for Katy Bridge

After a year's successful operation, the Missouri-Kansas-Texas bridge across the Missouri river at Boonville, Mo., continues to attract attention, not only because it is the world's longest railroad lift bridge but because it has functioned so perfectly from the day it was opened. The lift span of this bridge is 408 ft. in length. Special praise has been given to the manner in which the mechanism of the bridge has operated. Maintaining the even tenor of its way while rising, the lift span has not become as much as ½ in. out of level throughout its entire length of 408 ft., not even during the severe test imposed by the accelerating period.

Relics in a Wall

Seven passes, issued in 1882 and good for transportation on the old Oregon Railway & Navigation Company, were found when a wall in an old building at Portland, Ore., was torn down. Along with the passes were a cancelled check for $48.50 and a book of rules and regulations in force on the railroad at that time. One of the most interesting rules was the one governing the speed of trains. Under this regulation, no passenger train was permitted to exceed a speed of 18 miles an hour, and freight trains were restricted to a maximum of 13 miles an hour. This, of course, was before the days of 40-mile-an-hour competitive motor trucks.

This Car is Getting Into a Rut

According to E. L. Tobie, president and general manager of the Burlington, Muscatine & Northwestern, there is a certain Southern Pacific car which seems to have found a permanent niche in the transportation business. Mr. Tobie tells us that on April 25, Southern Pacific freight car No. 15723 was billed from Westwood, Cal. by the Red River Lumber Company, consigned to the Roach & Musser Company, Muscatine, Iowa. The Burlington, Muscatine & Northwestern completed the delivery of the car on May 1. Then, on May 22, the same car was billed from the same place by the same shipper to the same consignee, the same railway completing delivery on May 29.

50th Anniversary of Pocahontas Coal

The 50th anniversary of the reason why the Norfolk & Western is currently one of the most successful railroads in the United States was celebrated the other day. That reason is Pocahontas coal, and the semi-centennial anniversary arose from the fact that the first car of coal mined on the Norfolk & Western was loaded at Pocahontas, Va., in 1883. The first car was used by the railroad for fuel, while the second car, loaded on the following day, was presented by the railway to the city of Norfolk, Va. Gayly decorated with bunting, the arrival of the car presented to the city of Norfolk on March 17 was the occasion of quite a celebration. After it had been viewed by thousands of cheering spectators, the car was finally placed on exhibit in the passenger station. The Norfolk *Virginian* of March 18, 1883, said that "many people got specimens of the coal, and it is said that every man, woman and child along the Norfolk & Western between Roanoke and this city has a piece carefully preserved."

A New England Candidate for Commuting Honors

An outstanding record as a commuter is held by Fred W. Cross, military archivist in the department of the attorney general of the Commonwealth of Massachusetts, according to J. M. Carley, assistant engineer in the valuation department of the Boston & Albany at Boston, Mass. Commencing his active commuting in 1914, Mr. Cross has made the trip between Boston and Royalston, 75½ miles each way, many thousand times. Between 1914 and 1918 he had a record of not less than 500 trips, and for the next ten years and two months he averaged 275 round trips per year. Since 1929, he has traveled over the same route during the summer months and at various other times to the extent of some 5,500 miles. Mr. Cross' grand total mileage for the nineteen years as a commuter is estimated to be not less than 560,000 miles, or 23 times around the world. At an average rate of one cent per mile, which may not be exactly correct, he has paid the Fitchburg and the Boston & Maine some $5,600 for his transportation, and at an average speed of 30 miles per hour, he has spent 777 full days, or 2⅛ years, on the road. Mr. Cross is probably the man we have been looking for to get an answer to that perennial problem of commuters—how to get a seat on the shady side of the car.

Sargent Honored for Civic Services

For outstanding civic services to the city of Chicago during 1932, Fred W. Sargent, president of the Chicago & North Western, has been presented with the Benjamin J. Rosenthal Foundation medal. As chairman of the citizens' committee on public expenditures in Chicago, Mr. Sargent played a prominent part in bringing order out of the financial chaos in which the local governments had found themselves. The medal was presented to Mr. Sargent by George W. Rossetter, president of the Chicago Association of Commerce, at a luncheon attended by Mayor Kelly and other outstanding citizens.

More Way-Back Pay

Liquidation of almost forgotten, if not frozen, assets continues to be one of the popular activities of the day, in spite of the rapid progress of the "New Deal" in Washington. For the latest incident of this sort, we are indebted to A. J. Baird, auditor of the Texas & Pacific, who has reason to be proud of the way in which the records of his company are kept. One day last month, relates Mr. Baird, there appeared at the paymaster's office one Henry Cooper who, until September 22, 1931, had worked for the Texas & Pacific at various intervals as section laborer, station porter and train porter. The object of Cooper's visit was to present a claim for pay due him for work performed as a section laborer at Queen City, Tex., in July, 1889. Concealing their surprise, as if the claim were nothing out of the ordinary, employees in the paymaster's office made a search of the records, to find that a pay check had been issued to Cooper for that month, that it had been unclaimed and that it had been cancelled in December, 1890. A duplicate of the check was issued and paid. The amount was $2.95.

Stories about Storey

Stories about William B. Storey, who retired recently from the presidency of the Atchison, Topeka & Santa Fe, are going the rounds these days. One of his most unusual habits—unusual, at least, in a time when few people will walk more than a block unless they have to—was that he walked every morning between his home at 199 Lake Shore drive in Chicago and his office in the Railway Exchange, no matter what the weather. His punctuality was such, furthermore, that one of his friends has remarked that he could set his watch by Mr. Storey's appearance in the morning. One of the Storey anecdotes has to do with a trip that he took a few years ago to Carlsbad Cavern in New Mexico. With a party of friends, he set out on foot to descend into the cavern, a matter of four or five hours' walking. After three hours of steady tramping, a member of the party said, "Perhaps you'd like to rest a little, Mr. Storey." "I'm all right," was Mr. Storey's reply, "but if you boys are tired, we'll sit down awhile." Simplicity was the basis of Mr. Storey's tastes. His office was plainly furnished, and throughout his 13 years as president of the Santa Fe, he retained and used the desk of his famous predecessor, Edward P. Ripley. Although readily accessible, Mr. Storey was quite a trial to newspaper men during the years of the depression. He was frequently solicited for statements about current developments and predictions as to the future, but he rarely gave newspapermen exactly what they hoped for. In spite of all importunities, Mr. Storey steadfastly refused to be the source of mere optimistic chatter.

NEWS

N. & W. President Receives 50-Year Service Insignia

A. C. Needles became a "diamond veteran" at presentation ceremonies on July 1

President A. C. Needles of the Norfolk & Western became a "diamond veteran" of that road on July 1. That date was the fiftieth anniversary of Mr. Needles' affiliation with the N. & W. and thus it became the occasion for presentation ceremonies at which he was awarded the diamond insignia of the Norfolk & Western Veterans Association.

The presentation was made on behalf of the N. & W. board of directors by the chairman of its executive committee, D. W. Flickwir, for whom Mr. Needles once worked as yard clerk and brakeman at Roanoke. Among other participants in the ceremonies were Mrs. Needles and the following N. & W. executives: W. J. Jenks, vice-president in charge of operation; B. W. Herrman, vice-president in charge of traffic; W. S. Battle, Jr., vice-president in charge of real estate, valuation and public relations; and T. F. Sheehan, president of the Norfolk & Western Veterans Association.

Congratulating Mr. Needles on his long service Mr. Flickwir told the N. & W. president that his record was an enviable one and that of 82 chief executives listed in Who's Who in Railroading, "only one besides you has served the same railroad for as many as 50 consecutive years."

Mr. Needles first entered the service of the Shenandoah Valley (now part of the N. & W.) as a rodman on the engineering corps on July 1, 1883. Prior to that time he served about a year on the Washington, Ohio & Western, a projected railroad which was then being surveyed. Going to Roanoke in 1884, Mr. Needles became a yard clerk, then took a job as brakeman and was soon promoted to yardmaster. Later he was sent to Pulaski, Va., as yardmaster and in 1889 he went to Bluefield, W. Va., in the same capacity. On August 1, 1890, he was appointed assistant trainmaster and was in charge of the Clinch Valley line for some time. His next promotion came Christmas day, 1898, when he was appointed trainmaster, Radford division. On May 22, 1901, he became assistant superintendent of the Pocahontas division and exactly a month later he was chosen as superintendent of the Shenandoah division. On October 6, 1902, he was transferred to the Norfolk division and on December 16, 1902, he was transferred to the Pocahontas division, serving as superintendent in each instance. Thus, he was superintendent on three different divisions within a period of a little more than two months. On February 1, 1904, he was appointed general superintendent of the entire system.

He was advanced to the position of general manager on December 1, 1912, and was promoted to operating vice-president on January 1, 1918. On June 1, 1918, he was appointed federal manager under the United States Railroad Administration, holding that position until March 1, 1920, when the railroads were returned to private operation. He then resumed his position as vice-president in charge of operation. On January 1, 1921, he was given charge of the traffic department in addition to his other duties, with the title of vice-president in charge of operation and traffic. When former president N. D. Maher retired on May 1, 1924, Mr. Needles was elected president.

The only other N. & W. executive to possess the diamond insignia is B. W. Herrman, vice-president in charge of traffic, who received it from Mr. Needles on March 4 this year. By his graduation into the "Diamond Club" of Norfolk & Western Veterans Mr. Needles joins a limited number who received the diamond insignia.

New Committee in East

L. F. Loree, president of the Delaware & Hudson and chairman of the Eastern Presidents' Conference, has appointed a new committee to take up the work heretofore carried on by the committee on preventable wastes. Reorganization of the latter was required after several of its members retired to assume membership on the Eastern Co-ordinating Committee.

Members of the new committee are as follows: C. E. Denney, president of the Erie; C. H. Ewing, president of the Reading; E. S. French, president of the Boston & Maine; Elisha Lee, vice-president of the Pennsylvania; R. B. Starbuck, executive vice-president of the New York Central; E. E. Loomis, president of the Lehigh Valley; and J. M. Davis, president of the Delaware, Lackawanna & Western.

Class I Railroads Show Increased Net for May

Return for month averages 2.04 per cent as compared with 0.58 per cent in May, 1932

Class I railroads for the first five months of 1933 had a net railway operating income of $93,431,647, which was at the annual rate of return of 1.06 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first five months of 1932, their net was $97,313,173 or 1.10 per cent. Operating revenues for the first five months totaled $1,136,926,253, compared with $1,339,825,485 for the same period in 1932, or a decrease of 15.1 per cent. Operating expenses amounted to $883,621,639, compared with $1,069,588,880 for the same period in 1932, or a decrease of 17.4 per cent. Class I railroads in the first five months of 1933 paid $110,541,002 in taxes, compared with $122,220,430 for the same period in 1932, or a decrease of 9.6 per cent. For May alone, the tax bill amounted to $22,388,350, a decrease of $2,061,482 under May, 1932. Sixty-four Class I railroads failed to earn expenses and taxes in the first five months of 1933, of which 16 were in the Eastern district, 12 in the Southern and 36 in the Western.

Class I railroads for May had a net of $40,693,072 which, for that month, was at the rate of 2.04 per cent. In May, 1932, their net was $11,665,702 or 0.58 per cent. Operating revenues for May amounted to $255,255,756, compared with $251,921,717 in May, 1932, an increase of 1.3 per cent. Operating expenses in May totaled $181,584,038 compared with $205,222,152 in the same month in 1932, a decrease of 11.5 per cent.

Class I railroads in the Eastern district for five months had a net of $72,317,552, at the rate of 1.62 per cent. For the same period in 1932, their net was $81,034,163 or 1.82 per cent. Operating revenues in the Eastern district for five months totaled $583,264,868, a decrease of 16.5 per cent.

CLASS I RAILROADS—UNITED STATES

	1933	1932	Per Cent
Month of May			
Total operating revenues	$255,255,756	$251,921,717	1.3 Inc.
Total operating expenses	181,584,038	205,222,152	11.5 Dec.
Taxes	22,388,350	24,449,832	8.4 Dec.
Net railway operating income	40,693,072	11,665,702	248.8 Inc.
Operating ratio—per cent	71.14	81.46	....
Rate of return on property investment—per cent	2.04	.58	....
Five Months Ended May 31			
Total operating revenues	$1,136,926,253	$1,339,825,485	15.1 Dec.
Total operating expenses	883,621,639	1,069,588,880	17.4 Dec.
Taxes	110,541,002	122,220,430	9.6 Dec.
Net railway operating income	93,431,647	97,313,173	4.0 Dec.
Operating ratio—per cent	77.72	79.83	....
Rate of return on property investment—per cent	1.06	1.10	....

while operating expenses totaled $432,909,743, a decrease of 19.0 per cent. Class I railroads in the Eastern district for May had a net of $23,212,638 compared with $13,109,256 in May, 1932.

Class I railroads in the Southern district for five months had a net of $19,396,302, at the rate of 1.38 per cent. For the same period in 1932, their net amounted to $8,900,389, at the rate of 0.63 per cent. Operating revenues in the Southern district for five months amounted to $156,545,856, a decrease of 8.3 per cent under the same period in 1932, while operating expenses totaled $118,316,549, a decrease of 16.6 per cent. Class I railroads in the Southern district for May had a net of $5,589,445, compared with an operating deficit of $320,771 in May, 1932.

In the Western district for five months the net railway operating income was $1,717,793, at the rate of 0.06 per cent. For the same five months in 1932, the railroads in that district had a net of $7,378,621, at the rate of 0.25 per cent. Operating revenues in the Western district for five months amounted to $397,115,529, a decrease of 15.7 per cent under the same period in 1932, while operating expenses totaled $332,395,347, a decrease of 15.5 per cent. For May the Class I railroads in the Western district reported a net of $11,890,989. The same roads in May, 1932, had a deficit of $1,122,783.

$237,000,000 Rivers and Harbors Program Proposed

Officials of the War Department have recommended to the new public works advisory committee a program of expenditures for rivers and harbors improvements, as part of the federal government's public works program, amounting to $237,000,000 in addition to $127,000,000 for flood control. This includes all projects approved by Congress or the chief of engineers of the War Department. The committee was to consider this in connection with a long list of other projects and make recommendations to the President.

L. C. L. Perishable Shipment from Philadelphia to New Orleans

Maintained for the five days it was en route at temperatures varying from 10 to 20 deg. F., an l.c.l. shipment of frozen peaches was recently moved over a rail-water route between Philadelphia, Pa., and New Orleans, La. Packed in a Church Freight Service insulated container with solid carbon dioxide as a refrigerant the shipment was handled from Philadelphia to Norfolk, Va., by the Philadelphia & Norfolk Steamship Company, thence via the Seaboard Air Line to Atlanta, Ga., where, after re-icing, it was delivered to the Southern for movement to New Orleans. When the container was opened at destination the temperature inside was 20 deg. F.

Canadian Wage Question Deadlocked

The conference in Ottawa last week between the two principal Canadian railways and representatives of trainmen, enginemen and operators in regard to the proposed 20 per cent wage reduction ended in a deadlock. The reduction would be 10 per cent below present rates, which are 10 per cent under the basic scale. After the conference representatives of the unions met and, it is reported, decided to take a strike vote.

Permission must be obtained from the heads of the various railway brotherhoods before a strike vote can be submitted to the membership and according to reports from the meeting a decision was being arrived at to request such permission. The executives of the unions will meet again on July 17.

Eastern Railroads To Reduce Anthracite Coal Rates

Rate reductions ranging from 28 cents to $1.24 per gross ton on household sizes of anthracite coal moving over all-rail routes from mines in Pennsylvania to destinations in New England and Westchester county, New York were decided upon at a meeting of the Presidents' Traffic Conference—Eastern Territory on June 23. Under the new schedules, which will become effective as soon as tariffs can be arranged and authority secured from the Interstate Commerce Commission "for certain departures from the letter of the Fourth section of the Interstate Commerce Act," the rate for anthracite coal from Pennsylvania mines to Boston, Mass., will be $3.65 per ton or a reduction of 63 cents from the present rate of $4.28.

Smoke Prevention Association Elects Officers

One of the features of the twenty-seventh annual convention of the Smoke Prevention Association, held at Chicago, June 20 to 23, inclusive, was the two-day railroad session, a detailed program of which was published on page 875 of the *Railway Age* of June 17. At the conclusion of its technical sessions, the association elected the following officers for the ensuing year: President, F. E. Trumbull, chief smoke inspector, Buffalo, N. Y.; first vice-president, L. G. Plant, president, Railway Engineering Equipment Company, Chicago; second vice-president, J. P. Morris, master mechanic, Atchison, Topeka & Santa Fe, Chicago; secretary-treasurer, F. A. Chambers, deputy smoke inspector, Department of Smoke Abatement and Inspection, Chicago.

Co-ordinated Air-Rail and Air-Water Services

Co-ordinated air-water and air-rail services between New York and Boston, Mass., and summer resorts on Martha's Vineyard and Nantucket islands are being provided under arrangements recently completed between the New York, New Haven & Hartford and its subsidiary, the New England Steamship Company, and the Island Airways Service.

Under the co-ordinating plan the seaplanes of the Island Airways Service will use the New England Steamship Company's terminal at Pier 14, North River, N. Y., as a base while the sale of tickets for both air and water service will be handled by the present staff of the New England Steamship Company. Through tickets will be sold whereby a passenger may use the New York-New Bedford, Mass., boat line of the New England and thence the air service from New Bedford to Martha's Vineyard and Nantucket. Air service to these islands will also be co-ordinated at New Bedford and Wood's Hole, Mass., with New Haven train services out of Boston.

Consolidated South Jersey Passenger Train Service

The co-operative operation of passenger trains between Philadelphia and Atlantic City, Cape May and other seashore terminals recently announced by the Pennsylvania and the Reading (*Railway Age*, June 17, page 879) was put in effect on June 25, and new joint time tables, showing movements in detail, are given in the Official Guide for July, pages 320-326. Express trains between Camden and Atlantic City are run over the Reading from Camden to Arkansas Avenue, Atlantic City. Trains from Broad Street station, Philadelphia, by way of the Delaware River Bridge, to Atlantic City and other seashore points continue as before, except that on the Ocean City branch the Reading tracks are used. Local suburban trains taking passengers to and from Philadelphia will continue to take and leave passengers at the same stations as heretofore.

I. C. C. Drops Over 600 Employees

Because of a drastic reduction in its appropriations for the next fiscal year the Interstate Commerce Commission has notified 529 of the 910 employees in its Bureau of Valuation and 84 of the 310 in its Bureau of Accounts that it would be necessary to place them on furlough without pay for 90 days, thus preserving their status as government employees while efforts are made to find them other positions, and that if such efforts are not successful it would then be necessary to separate them from the service. As an experiment the two bureaus will be operated on a five-day week basis from July 1 to November 1. This announcement was made after Washington newspapers for several days had published conflicting statements as to whether the commission was to discharge or retain several hundred employees. The commission's appropriation for the year was reduced about $2,000,000 to $5,190,000 and the valuation appropriation was reduced from $2,750,000 to $1,000,000 because of the discontinuance of recapture work and a curtailment of the valuation requirements. It is expected that some of the furloughed employees will find positions in the office of the federal co-ordinator of transportation.

Appointment of C. N. R. Trustees Delayed

The government of Canada is experiencing difficulty in securing suitable candidates for the board of trustees for the Canadian National, set up by the new railway legislation which became operative July 1. For that reason, it was announced in Ottawa last week, the present board of directors will continue in office for at least another month.

The hope was expressed by Sir George Perley, Acting Prime Minister, that the board of three trustees who will replace the 17 directors, will have been constituted

by the end of July. In the meantime the co-operative measures which the legislation directs the Canadian National and Canadian Pacific to adopt are being followed to as great an extent as possible.

The efforts of the Canadian National to economize and co-operate with the Canadian Pacific are not being prejudiced by the delay, the Acting Prime Minister stated. "While during the first four months of the present year," he said, "the railway did not pay operating expenses, it is anticipated that from May to the end of the year the railway will improve its position. In fact during the month of May improvement is very noticeable."

Reduced Fares to Seashore on Pennsylvania and Central of New Jersey

New round-trip fares were put in effect July 8, to stimulate travel between New York, Jersey City, N. J., Newark, Elizabeth, Rahway and North Jersey seashore resorts, as well as between communities located on the line of the New York & Long Branch from South Amboy to Bay Head Junction, by both the Central of New Jersey and the Pennsylvania. During the past two years these roads have run low-rate excursions to all the North Jersey coast resorts, but these trains were run only on Sundays and Wednesdays. In addition to continuing the Sunday and Wednesday excursions and the low-price week-end tickets, they now announce two new types, namely: A one-day, round-trip ticket, good every day, the fare to be a marked reduction as compared with the regular two-way fare and secondly, supplementary to the summer tourist fares which apply from New York to the shore only, the two roads will now sell a new round-trip ticket, good for 30 days, at a substantial reduction compared with regular fares or summer tourist fares. Both the one-day and 30-day tickets will be accepted on the trains of the two railroads, and will also be good on the Sandy Hook (steamer) route.

Pennsylvania Makes Repayment on R. F. C. Loan

Repayment of $9,500,000 of the $27,500,000 loan granted the Pennsylvania last year for the electrification between New York and Washington, was announced on June 30 by the board of directors of the Reconstruction Finance Corporation. The first payment of $5,000,000 was made that day at the New York Federal Reserve Bank and the remaining $4,500,000 was to be paid on Wednesday. At the same time it was announced that the Pennsylvania had withdrawn its application for the undisbursed $600,000 of the $2,000,000 work loan previously authorized.

The directors of the corporation are "of the opinion that this action on the part of the Pennsylvania Railroad may be indicative of an early return of the railroads of the country into private financing, an objective which they believe to be an essential step of recovery for the transportation systems of the country."

Up to June 26 the Reconstruction Finance Corporation had advanced $372,778,401 to railroads and repayments had been made on railroad loans to the amount of $20,544,050, including $8,300,000 which had been repaid by the Cincinnati Union Terminal Company.

At the end of 1932 the corporation had authorized loans amounting to $337,435,093 to 62 railroads but there has been a marked reduction in the applications this year.

Total cash advances made by the R. F. C. to July 1 amounted to $2,636,046,740.

Canadian Roads' Earnings in May

The May earnings statement of the Canadian Pacific shows the first increase in net over that of the preceding year since last September. Gross shows a further decline, but this has been more than offset by economies in operation. Gross for the month was $8,789,285, as compared with $9,517,355 in 1932. Expenses during May were reduced by $966,514 to $7,813,476, leaving net revenue at $975,809, against $737,364, an increase of $238,444.

For the five-month period ended May, gross totaled $40,283,863, a reduction of $7,264,634 from 1932. Expenses were reduced by $6,403,125 to $37,472,110, leaving net for the five months $2,811,753, as compared with $3,673,263 a year ago, a decline of $861,509.

Net revenues of $193,206 were shown by the all-inclusive system of the Canadian National during May. Gross revenues for the month were $12,260,416, a reduction of $929,107 from the figure for May, 1932, while operating expenses, totaling $12,067,210, were $691,283 below the figure for 1932. Net revenue showed a decline of $237,824 from the net of May last year. May this year, however, was the first month in 1933 in which gross revenues exceeded expenses.

For the five months' period ending May 31, gross revenues were $53,948,849, a decrease of $12,425,929 from last year. Operating expenses, totaling $57,913,726, showed a decline of $8,576,597, and the operating deficit for the first five months of 1933 was $3,964,877 as compared with a deficit for the same period last year.

Railroad Credit Corporation to Begin Distribution

Net revenues derived from the emergency rates granted by the Interstate Commerce Commission under Ex Parte 103 and received by the roads participating in the Marshalling and Distributing Plan administered by The Railroad Credit Corporation, amounted to $74,744,279 in the 15 months ended on March 31, 1933, that the plan was in operation, according to a report submitted by the corporation to the commission. For the 15-month period the railroads paid to The Railroad Credit Corporation revenues derived from the emergency rates and from these revenues, loans were made by the corporation to prevent defaults in fixed interest obligations. Since April 1, 1933, however, the railroads are retaining such revenue and are to continue to do so until September 30, when the emergency rates terminate.

Of the $74,744,279 received in the 15 months period, The Railroad Credit Corporation made loans amounting to $73,691,368, of which $1,472,339 has been repaid. This leaves outstanding loans amounting to $72,219,029.

The period in which loans could be made the corporation terminated on May 31, and its activities after that date are limited to liquidation. As borrowing roads repay their loans this money will be distributed from time to time to member lines. The first distribution to the participating carriers will be made on July 15, 1933, at which time they will receive 4 per cent of the amounts they have paid into the corporation. Further repayments to the participating carriers will depend on receipts from liquidation.

Over 500 Attend New York Railroad Club Outing

More than 500 members and guests of the New York Railroad Club attended the Club's annual outing on June 29 at the Westchester Country Club, Rye, N. Y. The program of events, getting under way at 10 a.m. with a golf tournament in which there were 256 entrants, continued throughout the day to a closing at the evening's get-together dinner at which trophies and prizes were awarded.

The Johns-Manville foursome, composed of R. P. Townsend, C. A. Hodgman, L. R. Hoff, and P. D. Mallay, won the team match for the third time and thus obtained permanent possession of the club trophy. L. M. O'Neill, was this year's winner of the Brady cup for low net score of all classes. This Brady cup must be won twice by the same player before it can be permanently retained.

Prizes for other golf events were awarded as follows: Class A, low gross—Joseph H. Parsons, low net—L. H. Foster; Class B, low gross—P. D. Mallay, low net—E. L. Brown; Class C, low gross—C. C. Hubbell, low net—D. P. Thompson; Guest Prize—B. C. Dietterick; Kickers Handicap—B. P. Flory. Other prizes were awarded as follows: Driving contest for golfers, first and second prizes respectively—Messrs. Gellatly and Betage; putting contest for golfers, first prize—W. P. Rave, second prize—R. P. Townsend; driving contest for non-golfers, first prize—W. J. Berka; putting contest for non-golfers, first prize—C. L. Jones, second prize—P. R. Keller; quoits, first prize—P. E. Eppolito, second prize—John Kelly, third prize—E. Decker.

Third Quarter Traffic Estimated at 10 Per Cent More than Last Year

Freight car loadings in the third quarter of 1933 will be approximately ten per cent above actual loading in the same quarter in 1932, according to estimates compiled by the thirteen Shippers' Regional Advisory Boards. This estimate, which is the first to show an increase in any quarter since the fourth quarter of 1929, is based on reports received from approximately 20,000 shippers as the result of a questionnaire sent to them by the boards.

Of the 13 regional boards, the territories of which cover the entire United States, 12 reported an increase in the estimated car loadings and only one, the Trans-Missouri-Kansas, reported a decrease. This was due to reduction in the grain crop in that territory.

Of the 29 commodities covered in the forecast, it is anticipated that 23 will

show an increase. They are: Flour, meal and other mill products; Cotton; Cotton seed and products, except oil; Citrus; Other fresh fruits; Fresh vegetables other than potatoes; Live stock; Poultry and diary products; Coal and coke; Ore and concentrates; Salt; Lumber and Lumber products; Sugar, syrup and molasses; Iron and steel; Machinery and boilers; Brick and clay products; Lime and plaster; Agricultural implements and vehicles other than automobiles; Automobiles, trucks and parts; Fertilizers; Paper, paperboard and prepared roofing; Chemicals and explosives, and Canned goods.

The six commodities for which reductions are estimated are: All grain, Hay, straw and alfalfa; Potatoes; Gravel, sand and stone; Petroleum and Petroleum products, and Cement.

Of the commodities in which increases are expected those showing the largest increases are Ore and concentrates with 92.5 per cent; Automobiles, trucks and parts with 49.1 per cent; Iron and steel with 47.1 per cent; Cotton with 45.5 per cent; Machinery and boilers, 22.9 per cent, and Coal and coke, 11.7 per cent.

Regional Co-ordinating Committees Selected

Co-ordinating committees to represent Eastern and Western railroads in accordance with the provisions of the Emergency Transportation Act of 1933 were selected at meetings held in New York and Chicago during the latter part of last week.

The Eastern Presidents' Conference, meeting in New York on June 29, selected the following: W. W. Atterbury, president of the Pennsylvania; J. J. Bernet, president of the Chesapeake & Ohio; J. J. Pelley, president of the New York, New Haven & Hartford; Daniel Willard, president of the Baltimore & Ohio; and F. E. Williamson, president of the New York Central.

Forty-eight representatives of Western railroads selected by the boards of directors met at Chicago on June 30, and selected the following: Carl R. Gray, president of the Union Pacific; S. T. Bledsoe, president of the Atchison, Topeka & Santa Fe; H. A. Scandrett, president of the Chicago, Milwaukee, St. Paul & Pacific; Ralph Budd, president of the Chicago, Burlington & Quincy; and Hale Holden, chairman of the board of the Southern Pacific.

The federal co-ordinator of transportation on June 27 approved the plan of The American Short Line Railroad Association for the selection of the special members of the regional co-ordinating committees to represent the steam railroads having in 1932 earnings of less than $1,000,000. The plan, which was submitted to the co-ordinator by W. L. White, president, and C. A. Miller, general counsel, of the association, is in line with a resolution unanimously adopted at the annual meeting of the association in Chicago on June 24 at which 75 per cent of the members of the association were represented.

By the terms of the plan the Association nominates one member for each of the three regional co-ordinating committees, and four members to constitute an advisory board to work with the special member of the co-ordinating committee. These nominees are to be submitted to all short lines, both members and non-members of the association, for ballot, provision being made by which every short line may vote either for the nominees of the association or for any other person they desire. The result of the balloting is to constitute the association's recommendation to the co-ordinator for selection as the special members of the regional co-ordinating committees. Each short line is to have one vote regardless of mileage. It is provided that all ballots are to be returned to the association not later than July 15.

Notes on the Chicago Fair

The Monte Alban jewels of Mexico are being displayed in one of the four cars of the Presidential train of Mexico now at the Century of Progress. The train and the jewels were moved from Mexico City to Chicago on fast schedule and under heavy military protection.

A total of 366,139 persons have passed through each of the trains exhibited by the Baltimore & Ohio, the Chicago, Burlington & Quincy, and the London, Midland & Scottish from May 27 to June 24, an average of 13,075 persons per day.

A lounge and park—Chicago & North Western Railway Park—was opened opposite the Travel and Transport building on July 2, with locomotive No. 3024, one of the North Western's Class "H," as the dominant feature. The locomotive is in the center of the plot of ground and the cab is open to visitors with an engineman on hand to explain the workings of the gages, the valves and recorders on the boilerhead, the automatic stoker and the continuous automatic train control apparatus. Surrounding the locomotive is a set of 10 umbrella-top tables and plenty of chairs. Engine No. 3024 has just finished a two weeks' stand as the modern player in the "Wings of a Century" pagent. It elicited such favorable comment in this show that the company decided to leave it on public view for the remainder of the World's Fair.

The Mississippi, a wood-burning locomotive built in 1833 for service on the Mississippi Railroad, now a part of the Illinois Central, has been brought to the Fair from Brookhaven, Mass. After the Exposition, the locomotive will remain permanently in the Chicago Museum of Science and Industry.

Four Months Deficit $119,755,314

Class I railways in the first four months of 1933 had a net deficit of $119,755,314 after fixed charges, according to the Interstate Commerce Commission's monthly compilation of slected income and balance-sheet items. For the first four months of 1932 the deficit was $74,768,318. For the month of April this year the roads had a deficit of $24,838,801, as compared with $20,107,743 in April, 1932. The summary follows:

Selected Income and Balance-Sheet Items of Class I Steam Railways in the United States†

Compiled from 146 reports (Form IBS) representing 151 steam railways

TOTALS FOR THE UNITED STATES (ALL REGIONS)

For the month of April 1933	For the month of April 1932	*Income Items*	For the four months of 1933	For the four months of 1932
$19,019,628	$20,273,024	1. Net railway operating income	$52,738,561	$85,646,636
13,408,602	16,480,305	2. Other income	55,482,554	65,309,374
32,428,230	36,753,329	3. Total income	108,221,115	150,956,010
10,889,188	10,738,739	4. Rent for leased roads	42,715,490	42,071,057
44,412,092	43,998,402	5. Interest deductions	177,248,754	175,448,833
1,965,751	2,123,931	6. Other deductions	8,012,185	8,204,438
57,267,031	56,861,072	7. Total deductions	227,976,429	225,724,328
d 24,838,801	*d* 20,107,743	8. Net income	*d* 119,755,314	*d* 74,768,318
		9. Dividend declarations (from income and surplus):		
398,944	576,070	9-01. On common stock	11,704,754	18,573,660
239,842	808,481	9-02. On preferred stock	3,570,007	5,563,134

BALANCE-SHEET ITEMS

Selected Asset Items

	Balance at end of April 1933	Balance at end of April 1932
10. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	$769,980,021	$774,151,584
11. Cash	257,792,976	282,374,722
12. Demand loans and deposits	31,340,354	43,056,497
13. Time drafts and deposits	16,689,594	25,552,672
14. Special deposits	31,135,715	35,701,585
15. Loans and bills receivable	11,752,587	14,615,785
16. Traffic and car-service balances receivable	43,743,764	51,100,527
17. Net balance receivable from agents and conductors	38,768,731	38,067,134
18. Miscellaneous accounts receivable	136,111,818	148,872,671
19. Materials and supplies	305,667,187	363,449,463
20. Interest and dividends receivable	38,890,291	36,495,822
21. Rents receivable	3,054,423	3,881,616
22. Other current assets	4,682,035	5,576,469
23. Total current assets (Items 11 to 22)	919,629,475	1,048,744,963

Selected Liability Items

24. Funded debt maturing within six months*	$157,148,802	$103,974,666
25. Loans and bills payable‡	333,193,852	279,066,573
26. Traffic and car-service balances payable	57,809,612	65,158,559
27. Audited accounts and wages payable	211,885,098	217,414,354
28. Miscellaneous accounts payable	55,851,664	49,826,187
29. Interest matured unpaid	186,860,563	155,154,093
30. Dividends matured unpaid	4,928,312	5,512,853
31. Funded debt matured unpaid	66,364,524	53,533,602
32. Unmatured dividends declared	682,636	3,389,747
33. Unmatured interest accrued	109,640,689	106,518,550
34. Unmatured rents accrued	32,177,758	32,378,233
35. Other current liabilities	14,602,694	17,999,382
36. Total current liabilities (Items 25 to 35)	1,073,997,402	985,952,133

† Excludes returns for Class I Switching and Terminal Companies. Data for this class of roads were included in all published statements prior to January, 1933.

* Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within six months after close of month of report.

‡ Includes obligations which mature less than two years after date of issue.

d Deficit.

Equipment and Supplies

LOCOMOTIVES

THE DELAWARE, LACKAWANNA & WESTERN has placed an order for nine Diesel oil-electric switching locomotives. These were purchased after a 90-day test of their efficiency and of their economy in switching service. Six engines will be built by the American Locomotive Company at Schenectady, N. Y., and three will be built by the Ingersoll-Rand Company at Phillipsburg, N. J. The American Locomotive Company's allotment will be equipped with single unit McIntosh & Seymour engines of 600 hp. while those that the Ingersoll-Rand Company will build will be equipped with two 325 hp. Ingersoll-Rand engines. The General Electric Company will supply the electric equipment for the entire order. The new engines will be used for switching in the passenger stations at Hoboken, N. J., and at Scranton, Pa., as well as for light industrial switching in Jersey City. The Lackawanna's purchase is the first sizable order for railroad power placed in more than a year. Delivery of the engines will be made in the fall. This order includes the one locomotive ordered from the American Locomotive Company and the one from the Ingersoll-Rand Company on approval, as was reported in the *Railway Age* of February 25.

IRON AND STEEL

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 250 tons of structural steel for a bridge at Seneca, Ill., from the American Bridge Company.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has ordered 200 tons of structural steel for a grade separation bridge at Golf, Ill., from the Wisconsin Bridge & Iron Company.

PENNSYLVANIA.—Sinclair & Grigg, who have the contract to build this road's new pier at Baltimore, Md., have placed with the McClintic-Marshall Corporation an order for 4,500 tons of steel to be used in the work.

SIGNALING

THE CHESAPEAKE & OHIO has ordered from the Union Switch & Signal Company, material for the installation of centralize traffic control on its line between Ronceverte, W. Va., and White Sulphur Springs, twelve miles, double track. The machine will be fixed in the passenger station at Ronceverte. It will have twelve levers for signals and seven for switch movements. This company has also given an order for Union controlled manual block signals at "JN" Cabin, Richmond, Va. This plant will include spring switch protection. The machine will have four working levers, and push buttons for call-on signals. There will be ten searchlight signals.

MISCELLANEOUS

THE CHICAGO, BURLINGTON & QUINCY has recalled to work a total of 375 men at its Havelock shops for a period of at least four weeks.

THE SOUTHERN PACIFIC has placed 2,952 shopmen on a five-day week basis instead of the three-day week basis that has prevailed during the last two years.

PENNSYLVANIA.—Orders have been given to the Arundel Corporation, Baltimore, Md., to resume work on this road's new tunnel through Baltimore, work on which was suspended last year. In addition men will be put to work erecting poles for the electrification from Wilmington, Del., to Washington, D. C.

Supply Trade

The Permutit Company has removed its general offices from 440 Fourth avenue, to 330 West Forty-Second street, New York City.

Huntley H. Gilbert, sales manager at Chicago for the **Pressed Steel Car Company,** has been elected vice-president of the **Standard Steel Car Corporation,** Chicago, effective August 1.

F. L. Johnson has been appointed sales manager, Western district, of the **Pressed Steel Car Company,** Pittsburgh, Pa., with headquarters at Chicago, to succeed Huntley H. Gilbert, who has resigned.

The articles of incorporation of the **Osgood-Bradley Car Corporation** have been amended, changing the corporate name to the **Pullman-Bradley Car Corporation,** effective June 27.

George C. Isbester has become associated with the **Yale & Towne Manufacturing Company,** Philadelphia division. Mr. Isbester will have his headquarters in the Railway Exchange building, Chicago, and he will direct the sale of Yale hand and electric trucks and tractors to the railroads in the mid-western territory. Mr. Isbester has for several years been identified with the development of material handling methods and equipment for railway terminals, stores, shops and freight houses. He entered the railway field in 1899, in the mechanical department of the Great Northern, since which time he has been in almost continuous close contact with the railway supply and equipment industry. In 1917, Mr. Isbester entered the navy with the rank of captain, part of the time serving on the staff of Admiral Simms, commander-in-chief of the United States Navy in foreign waters.

American Car & Foundry Company Annual Report

For the second time in its thirty-four years of corporate life, the American Car & Foundry Company, for the year ending April 30, 1933, reported a loss from operations. This 1932-33 loss amounted to $2,211,270 as compared with a deficit of $2,577,277 for the previous year ending April 30, 1932, the latter being the fiscal period in which the company had its first experience with an operating loss. The report ventures no prediction as to when the "recently-enacted legislation for railroad relief will stimulate the buying of needed equipment," but it does observe that "the equipment is needed and sooner or later must be bought—and when the time comes for its purchase there is no doubt that your company will have its full share of the business."

The company's financial position continues strong. The balance sheet lists total current assets of $23,771,512, including $6,328,364 in cash as against total current liabilities of $630,365. The report is the first to be submitted by the new President, Charles J. Hardy, who succeeded William H. Woodin when the latter became Secretary of the Treasury in President Roosevelt's cabinet.

OBITUARY

Theodore G. Dickinson, president of the Marquette Cement Manufacturing Company, LaSalle, Ill., died suddenly of heart disease on July 2.

Construction

DETROIT & TOLEDO SHORE LINE.—A contract has been awarded the Roberts and Schaefer Company, Chicago, for a large capacity "N. & W." type multiple-track electric cinder plant for the terminal at Toledo, Ohio.

NEW YORK CENTRAL.—This company has given a contract to James Stewart & Company, Inc., New York, to build a section of its elevated highway from Clarkson street to Eighteenth street, New York City.

PORT ANGELES WESTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension up the Sol Duc valley, in Clallam county, Wash., 9 miles.

ST. LOUIS-KANSAS CITY SHORT LINE.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an electric railway between St. Louis, Mo., and Kansas City. The company some time ago applied to the Reconstruction Finance Corporation for a loan of $35,000,000 to finance the construction but approval was denied by the Interstate Commerce Commission on the ground that the company had no certificate for construction and was not a carrier.

LEASES ON TWO New York City piers—Pier 4 on the East river, and Pier 2 on the North river—have been given up respectively by the New York Central and Pennsylvania. Shortly after the Pennsylvania relinquished it, Pier 2, North river, was leased by the National Carloading Corporation which company will use the facility to handle both outbound and inbound New York freight.

Financial

BALTIMORE & OHIO.—*Closing of Circuitous Routes Proposed.*—This company has applied to the Interstate Commerce Commission for a modification of the condition imposed in connection with the authorization to acquire control of the Buffalo, Rochester & Pittsburgh under which the B. & O. agreed to maintain routes and channels via existing gateways in connection with the B., R. & P. As part of a program recently announced by the eastern railroads the company now desires to close a large number of circuitous routes.

CHICAGO & NORTH WESTERN.—*Bond Maturity.*—This company has asked holders of the $7,724,000 of 6 per cent consolidated mortgage bonds of the Fremont, Elkhorn & Missouri Valley, which mature on October 1, to accept payment half in cash and half in C. & N. W. 5 per cent general mortgage bonds. The cash the railroad expects to secure by a loan from the Reconstruction Finance Corporation. Holders who present their bonds for stamping under the plan prior to September 1 will receive 10 per cent in cash at the time.

CHICAGO UNION STATION.—*Tentative Valuation Corrected.*—The Interstate Commerce Commission has issued a correction in its tentative valuation report on the property of this company, which was reported in last week's issue, changing the final value of the property common-carrier owned from $46,500,000 to $49,350,000 and that of the property used from $47,350,000 to $46,500,000.

DENVER & RIO GRANDE WESTERN.—*R. F. C. Loan.*—The board of directors of the Reconstruction Finance Corporation has authorized a loan, previously approved and recommended by the Interstate Commerce Commission, for $950,000. The amount is the second advance out of an application of $2,250,000, of which $1,000,000 had previously been disbursed. The present authorization is to meet interest and maturities due July 1, 1933. Adjustments in the salaries of officers of the railroad have been made in accordance with the law passed by the 73rd Congress.

GREAT NORTHERN.—*Bonds.*—The Interstate Commerce Commission has authorized this company to pledge as collateral security for notes which may be issued under Section 20a (9) of the Interstate Commerce Act any portion of the $45,000,000 of its general mortgage 6 per cent, series F, bonds which are not pledged with the Reconstruction Finance Corporation.

GREAT NORTHERN.—*R. F. C. Loan.*—The directors of the Reconstruction Finance Corporation have authorized the loan of $6,000,000 to this company, to provide in part for interest requirements on July 1, which had previously been approved by the Interstate Commerce Commission. Adjustments in the salaries of officers were made as a condition.

ST. LOUIS-SAN FRANCISCO.—*Hearing on Reorganization Plan.*—The Interstate Commerce Commission has announced a public hearing in the proceedings for the reorganization of the St. Louis-San Francisco under the provisions of section 77 of the bankruptcy act, as amended, to be held on July 18, at Washington, at which there may be presented any plan of reorganization which the debtors, its receivers or trustees or any group of creditors, being not less than 10 per centum in amount of any class of creditors, are then prepared to present. For the purpose of the hearing parties having a substantial interest in the proceedings will, upon application and for good cause, be permitted at the hearing to intervene. The plan of reorganization attached to the debtors' petition to the United States district court for the eastern district of Missouri, eastern division, filed in that court on May 16, will be presented. After submission of evidence in support thereof opportunity will be given parties to present evidence in opposition to all or any features of that plan. Thereafter, other or different plans may be presented, together with evidence in support of and in opposition thereto. In the event that parties may require additional time for preparation of plans or preparation of evidence in opposition to plans presented at the hearing, adjournment of the hearing for a reasonable period may be arranged. Following the hearing or after the conclusion of any adjournment thereof, the commission will fix a time for filing briefs and after receipt thereof will render a report in which it will recommend a plan of reorganization (which may be different from any which has been proposed at the hearings), in compliance with subdivision (d) of section 77, which will be subject to further proceedings as provided in that subdivision. The plan recommended by the commission and, in its discretion, any other plan of reorganization filed as provided in that subdivision will be submitted to the creditors and stockholders of the debtor for acceptance or rejection. The hearing will be held before O. E. Sweet, director of the commission's Bureau of Finance.

Valuation Reports

Carbon County (final)	$335,000	1927
Marcellus & Oticso (final)	260,000	1927
Oklahoma & Rich Mountain (final)	190,000	1927

Average Prices of Stocks and of Bonds

	July 5	Last week	Last year
Average price of 20 representative railway stocks..	48.81	43.15	11.78
Average price of 20 representative railway bonds..	71.79	70.31	48.93

Dividends Declared

East Pennsylvania.—6 Per Cent Guaranteed, 1½ per cent, semi-annually, payable July 18 to holders of record July 8.

Richmond, Fredericksburg & Potomac.—Common, 2 per cent, semi-annually; Common Non-voting, 2 per cent, semi-annually; Dividend Obligations, 2 per cent, semi-annually, all payable June 30 to holders of record June 22.

THE KOPPEL INDUSTRIAL CAR & EQUIPMENT COMPANY, a subsidiary of the Pressed Steel Car Company, has received an order for 42 passenger cars, 36-in. track gage, from the Grant Park Transportation Company, Inc., Chicago, for use on a railroad which is being built in Grant Park, Chicago, from Monroe street to the entrance of the Century of Progress Exposition.

Railway Officers

EXECUTIVE

W. L. White, who was elected president of the American Short Line Railroad Association, at its annual meeting in Chicago on June 24, was born in Bevier, Mo., December 8, 1886. After completing a high school course in Chicago in 1903 he entered the service of the Chicago & Eastern Illinois as office boy in the office of the vice-president and treasurer. He later saw service in the auditing, traffic, operating and mechanical departments of the Chicago, Rock Island & Pacific, the Northern Pacific, the Southern Pacific, the Sierra of California and the Oregon Short Line. In 1915 he was appointed general freight and passenger agent of the Salt Lake & Utah, and he continued in that service until 1920 when he became assistant general manager of the Yosemite Valley at Merced, Cal. In 1921 he was appointed general manager of that road and held that position at the time of his election. He has been a member of the executive board of the American Short Line Railroad Association since 1923.

W. H. Gemmell, president of the Minnesota & International, with headquarters at Brainerd, Minn., has retired, effective August 1, under pension rules, and **Charles Donnelly,** president of the Northern Pacific, will assume the presidency of the M. & I. The Northern Pacific is the majority stockholder of the Minnesota & International and, after August 1, the management will be taken over by the executive offices in St. Paul and the operation by the Lake Superior division of the Northern Pacific, which has headquarters at Duluth.

Mr. Gemmell began his railroad activities with the Canadian Pacific at Montreal, Can., in 1887. Subsequently, he served the St. Paul, Minneapolis & Manitoba, and the Chicago, St. Paul, Minneapolis & Omaha, and entered the service of the Northern Pacific in August, 1896. He was general manager of the Minnesota & International for 33 years and for the last 12 years had served as its president. Thus his continuous service with the Northern Pacific and Minnesota & International totals 37 years.

The Minnesota & International serves the territory between Brainerd, Minn., and International Falls, and under the management of Mr. Gemmell, the lines of this railroad were extended from Bemidji, Minn., to Kelliher, Minn., and Grand Falls, Minn., and then by the Big Fork & International Falls Railroad Company to International Falls on the Canadian border, reaching that point in the fall of 1907.

OPERATING

J. O. Hackenberg, general superintendent of the Philadelphia terminal general division of the Pennsylvania has been granted a temporary leave of absence to become general manager of the Atlantic

City Railroad. In this new position Mr. Hackenberg will be in complete charge of the operation of the consolidated lines of the West Jersey & Seashore and Atlantic City Railroads in South Jersey.

Herbert M. Carson, general superintendent of the Central Pennsylvania division of the Pennsylvania, with headquarters at Williamsport, Pa., retired on July 1. Mr. Carson was born at Baltimore, Md., on March 13, 1867, and received his education at Lehigh University (M.E. 1889). He entered railroad service in 1889 as special apprentice at the Altoona shops of the Pennsylvania, and has since been continuously in the employ of that road. In 1892 he was appointed inspector of the West Philadelphia shop and the following year he became assistant road foreman of locomotives. In 1895, he was appointed assistant engineer of motive power at Altoona, and in 1900, he became master mechanic. The following year he was appointed assistant to general manager, with headquarters at Philadelphia, Pa., and since 1909, he has served as general superintendent, the position he held until his retirement.

C. E. Chamberlin, superintendent of the New York division of the Reading, with headquarters at Philadelphia, Pa., has been transferred to the Reading division, with headquarters at Reading, Pa., in the same capacity. **A. T. Dice, Jr.,** superintendent of the Harrisburg division with headquarters at Harrisburg, Pa., has been appointed to succeed Mr. Chamberlin as superintendent of the New York division. **D. S. Haldeman,** assistant superintendent of the Harrisburg and Reading divisions, at Reading, Pa., will continue as assistant superintendent of the Reading division with headquarters at Harrisburg, Pa., and the headquarters of **W. D. Kinzie,** assistant superintendent of the Shamokin division has been transferred from Tamaqua, Pa., to St. Clair, Pa. These changes became effective July 1, when the Harrisburg division was merged into the Reading division. Other changes made effective at the same time involved the transfer to the Shamokin division of the Mt. Carbon and Port Carbon branch, the Frackville Branch, the main line from Pottsville to Port Clinton, the Williams Valley branch, the Lebanon and Tremont branch from Pine Grove to Brookside, the Tremont branch, the Middle Creek branch, the Mine Hill and Schuylkill Haven branch, the People's Railway and all colliery branches in this territory; the transfer to the New York division of the Philadelphia and Chester Valley branch and Perkiomen branch; and the transfer to the Philadelphia division of the Germantown and Chestnut Hill branch, the Frankford branch, the Newtown branch from Newtown Junction to Frankford Junction, and the Newtown branch from Erie avenue to Olney and the main line from Manayunk to north end of Woodlane yard.

H. H. Garrigues, general superintendent of the Eastern Pennsylvania division of the Pennsylvania, with headquarters at Harrisburg, Pa., has been appointed general superintendent of the Central Pennsylvania division with headquarters at Williamsport, Pa., succeeding **H. M. Carson,** retired. **J. A. Appleton,** general superintendent of the Lake division with headquarters at Cleveland, Ohio, has been appointed general superintendent of the Eastern Pennsylvania division succeeding Mr. Garrigues. **F. L. Dobson,** superintendent of the Philadelphia Terminal division, has been appointed general superintendent of the Lake division, and **J. C. White,** superintendent of the Eastern division at Pittsburgh, Pa., has been transferred to the Philadelphia Terminal division to succeed Mr. Dobson. **H. T. Frushour,** superintendent of the St. Louis division, with headquarters at Terre Haute, Ind., has been transferred to the Eastern division to succeed Mr. White and in turn has been succeeded by **J. G. Sheaffer,** superintendent of the Logansport division, at Logansport, Ind. **F. C. Wilkinson,** who has been on duty in the office of the chief engineer, has been appointed superintendent of the Logansport division, succeeding Mr. Sheaffer. **Ivan B. Sinclair,** superintendent of the Pittsburgh division at Pittsburgh, has been appointed special agent in the office of the vice-president in charge of the Central region at Pittsburgh. He is succeeded by **T. C. Herbert,** at present superintendent of the Panhandle division at Pittsburgh. **C. E. Adams,** superintendent of the Toledo division, has been appointed superintendent of the Panhandle division at Pittsburgh and **E. C. Gegenheimer,** now superintendent of the Wilkes-Barre division at Sunbury, Pa., has been appointed superintendent of the Toledo division, and **C. G. Grove,** division engineer on the Panhandle division, is promoted to superintendent at Sunbury. **J. C. Poffenberger,** superintendent of the Maryland division at Wilmington, Del., has been appointed engineer maintenance of way of the Lake division, and **G. S. West,** superintendent of the Erie & Ashtabula division at New Castle, Pa., has been appointed superintendent of the Maryland division. **C. W. Van Nort,** division engineer of the Pittsburgh division, has been appointed superintendent of the Erie & Ashtabula division succeeding Mr. West. **F. H. Krick,** trainmaster on the Panhandle division, has been advanced to superintendent of the Cleveland division at Cleveland. **R. R. Metheany,** engineer maintenance of way on the Southern division at Wilmington has been transferred to Williamsport in a similar capacity and **R. P. Graham,** engineer maintenance of way at Williamsport, has been transferred to the Southern division to succeed Mr. Metheany.

MECHANICAL

W. E. Corya, assistant master mechanic of the Beardstown division of the Chicago, Burlington & Quincy, with headquarters at Beardstown, Ill., has been appointed master mechanic of the same division, a position he was holding at the time of his appointment as assistant master mechanic a year ago. The position of assistant master mechanic has been abolished.

C. E. Allen, assistant to the mechanical superintendent of the Northern Pacific, with headquarters at St. Paul, Minn., has retired after more than 52 years of continuous service with this company. Mr. Allen was born on June 29, 1863, at Paw Paw, Mich., and entered the service of the Northern Pacific as a locomotive fireman on the Missouri division on May 1, 1881. Three years later he became a hostler and switch engineman on the Missouri division, and on January 1, 1887, he was promoted to road engineman on the same division, being appointed road foreman of engines on the Montana and Yellowstone divisions on September 1, 1901. On September 1, 1903, he was advanced to master mechanic on the Yellowstone division and on April 1, 1908, he was transferred to the Montana division. On January 15, 1910, Mr. Allen was appointed general master mechanic of the Yellowstone, Montana and Rocky Mountain divisions, and on May 1, 1919, he was further advanced to general master mechanic of the lines east of Mandan, N. D. He was made assistant to the mechanical superintendent on September 1, 1930.

TRAFFIC

Rodney Macdonough, New England passenger agent of the Pennsylvania, with headquarters at Boston, Mass., retired on July 1, after nearly half a century of railroad service.

Thomas L. Faulkner, commercial agent for the Chicago & Eastern Illinois, at Tulsa, Okla., has been promoted to general agent with the same headquarters, to succeed **J. T. Paris** who has resigned to engage in other business.

ENGINEERING AND SIGNALING

S. R. Hursh, division engineer of the Philadelphia Terminal division of the Pennsylvania, has been transferred to Pittsburgh, Pa., to succeed **C. W. Van Nort,** who has been promoted to superintendent. **W. W. Patchell,** division engineer of the Ft. Wayne division, at Ft. Wayne, Ind., has been transferred to Philadelphia to succeed Mr. Hursh. **J. S. Gillum,** division engineer of the Erie & Ashtabula division, at New Castle, Pa., has been transferred to Ft. Wayne to succeed Mr. Patchell.

OBITUARY

W. A. Callison, superintendent of motive power of the Chicago, Indianapolis & Louisville, with headquarters at Lafayette, Ind., died suddenly on July 2.

E. D. Ainslie, general passenger agent of the Baltimore & Ohio at New York, died suddenly at the Long Island College Hospital, Brooklyn, N. Y., on July 4. He was 58 years old.

Charles A. Cairns, who retired on July 1, 1932, as passenger traffic manager of the Chicago & North Western, with headquarters at Chicago, died suddenly on July 1 at the West Suburban Hospital, Chicago. A sketch and photograph of Mr. Cairns was presented in the *Railway Age* of June 5, 1932.

Tables of Revenues and Expenses of Railways begin on next left-hand page

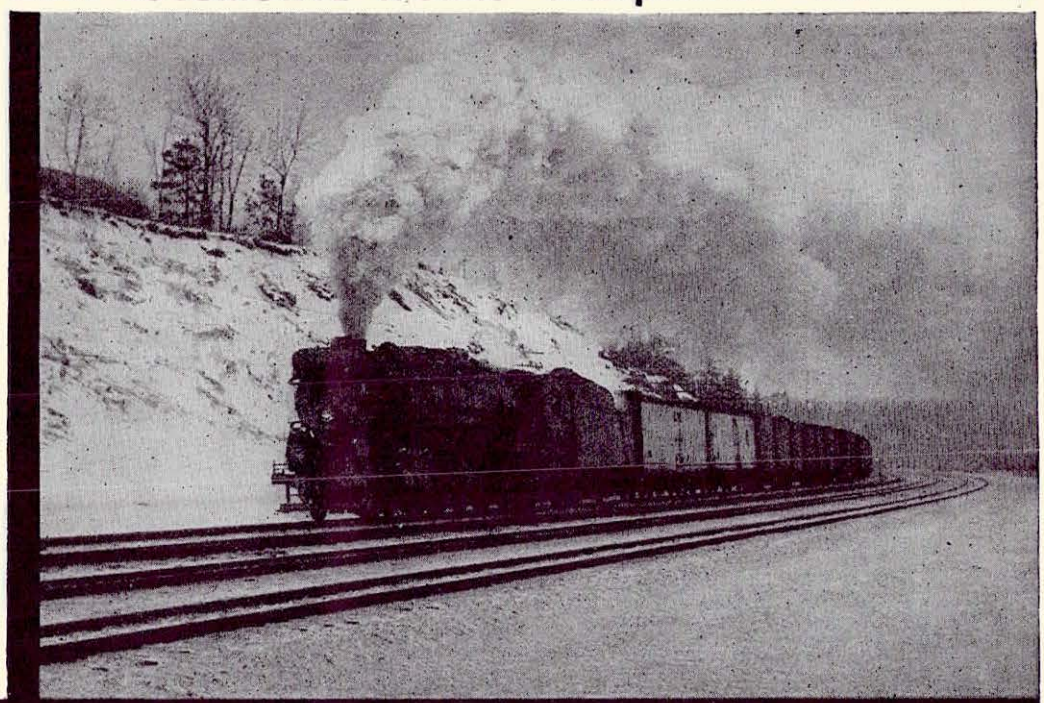
■ Operating conditions today demand the pulling of heavier trains at higher speeds.

■ Only by using locomotives capable of producing higher horsepower can train movement be speeded up without reducing tonnage.

■ Super-Power Locomotives start maximum train loads for a given weight on drivers, and have the POWER to pull such loads at higher speeds.

RESULT—*Lower Operating Costs*

LIMA LOCOMOTIVE WORKS · Incorporated · LIMA · OHIO



SUPER-POWER LOCOMOTIVES CUT OPERATING COSTS

LIMA LOCOMOTIVE WORKS INCORPORATED

Revenues and Expenses of Railways

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1933

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Akron, Canton & Youngstown	May	171	$134,035	$11	$139,325	$17,591	$16,994	$6,509	$36,620	$7,605	$84,771	60.8	$54,554	$43,343	$33,754	$13,485
	5 mos.	171	537,147	90	564,262	66,129	62,161	41,378	178,207	47,101	390,442	69.2	173,820	117,748	77,269	102,590
Alton	May	979	819,064	117,454	1,085,373	155,270	116,515	42,618	407,240	35,572	765,509	70.5	319,864	267,315	158,846	—35,003
	5 mos.	979	3,712,509	622,083	4,986,069	553,403	616,733	228,671	2,075,069	219,882	3,749,758	75.2	1,236,311	818,347	254,525	15,416
Alton & Southern	May	31	.....	.....	83,907	8,023	5,604	4,901	25,410	4,078	48,016	57.23	35,891	31,057	26,324	9,741
	5 mos.	31	.....	.....	378,206	31,694	29,814	24,457	132,313	20,905	239,183	63.24	139,023	114,413	91,673	77,147
Atchison, Topeka & Santa Fe	May	9,734	6,279,775	871,535	7,922,824	1,152,501	1,890,276	318,459	2,809,140	357,721	6,529,923	82.4	1,392,901	675,009	796,523	329,910
	5 mos.	9,735	28,034,868	4,027,032	35,472,816	4,790,340	9,380,458	1,548,545	13,837,461	1,870,784	31,429,543	88.6	4,043,273	—123,577	246,188	3,071,065
Gulf, Colorado & Santa Fe	May	1,955	950,069	34,527	1,061,825	176,702	263,003	48,406	379,326	62,622	930,145	87.6	131,680	46,516	—43,485	—99,929
	5 mos.	1,955	4,190,114	172,766	4,699,800	938,027	1,215,232	246,790	1,887,216	321,171	4,607,971	98.0	91,829	—337,855	—837,008	—320,180
Panhandle & Santa Fe	May	1,878	630,856	20,477	699,497	97,715	138,744	17,774	201,302	29,416	484,943	69.3	214,554	170,019	103,802	—171,320
	5 mos.	1,878	2,753,141	98,699	3,079,767	535,927	711,787	88,774	995,967	157,296	2,489,194	80.8	590,573	371,265	—9,097	—419,977
Atlanta & West Point	May	93	86,904	11,367	116,172	18,761	22,350	6,856	46,830	6,333	102,891	88.6	13,281	6,690	—7,531	—38,460
	5 mos.	93	343,608	69,387	489,322	88,612	114,952	34,156	232,757	33,456	513,407	104.9	—24,085	—65,396	—124,448	—126,910
Western of Alabama	May	133	84,671	13,004	110,470	20,511	27,936	6,868	42,972	6,905	106,547	96.4	3,923	—3,501	—408	—29,512
	5 mos.	133	381,482	74,157	509,935	97,418	144,871	34,477	201,699	34,169	520,436	102.1	—10,501	—47,626	—26,646	—84,643
Atlanta, Birmingham & Coast	May	639	182,774	3,403	217,405	41,689	42,093	19,958	96,326	14,418	225,274	103.8	—8,229	—21,841	—31,582	—68,442
	5 mos.	639	880,593	16,234	1,037,331	187,413	198,731	96,954	442,107	73,119	1,051,989	101.4	—14,658	—83,068	—146,921	—361,897
Atlantic Coast Line	May	5,144	2,952,588	288,183	3,640,997	400,520	649,733	105,406	1,170,324	129,555	2,470,050	67.8	1,170,947	670,799	505,164	—225,118
	5 mos.	5,144	14,319,157	2,478,994	18,694,962	2,079,592	2,975,101	562,381	6,055,690	641,892	12,459,664	66.6	6,235,298	3,831,684	2,987,325	1,338,361
Charleston & Western Carolina	May	342	179,321	1,130	185,621	26,445	21,504	6,106	54,608	5,277	113,940	61.4	71,681	55,679	52,238	35
	5 mos.	342	778,768	4,936	803,814	104,472	104,558	28,728	255,905	22,969	516,632	64.3	287,182	204,042	192,416	77,524
Baltimore & Ohio	May	6,404	8,466,030	715,084	9,892,546	745,056	1,514,961	321,610	3,425,912	522,616	6,607,204	66.8	3,285,342	2,620,105	2,252,817	1,288,197
	5 mos.	6,402	38,701,570	3,143,390	45,037,838	3,422,211	7,709,717	1,624,195	16,682,298	2,638,744	32,473,238	72.1	12,564,600	9,074,726	7,543,436	6,909,778
Baltimore & Ohio Chic. Term	May	84	.....	.....	250,873	16,338	44,827	1,474	135,190	10,610	212,925	84.9	37,948	—3,857	83,792	78,520
	5 mos.	84	.....	.....	1,195,987	85,084	194,856	7,518	666,913	66,560	1,045,004	87.4	150,988	7,029	439,782	409,237
Staten Island Rapid Transit	May	23	48,869	85,356	141,810	11,056	11,162	1,943	75,524	11,985	111,670	78.7	30,140	16,590	969	5,112
	5 mos.	23	255,063	399,744	687,303	38,366	57,960	8,469	377,190	58,767	540,752	78.7	146,551	72,186	—13,268	—14,163
Bangor & Aroostook	May	619	574,166	11,107	606,522	88,880	83,565	4,493	108,716	22,753	309,167	51.0	297,355	235,931	248,265	301,638
	5 mos.	619	2,997,653	102,441	3,203,659	392,074	421,187	21,636	608,566	118,036	1,564,613	48.8	1,639,046	1,332,791	1,260,315	1,411,938
Belt Ry. Co. of Chicago	May	54	.....	.....	344,318	23,369	28,219	2,320	140,880	9,496	204,284	59.3	140,034	97,075	139,754	94,590
	5 mos.	54	.....	.....	1,461,763	85,593	145,056	12,777	692,753	48,500	984,679	67.4	477,084	265,804	646,535	388,425
Bessemer & Lake Erie	May	225	524,280	537	533,885	50,672	122,650	9,882	100,466	30,123	313,740	58.8	220,145	232,305	242,915	—126,723
	5 mos.	225	1,322,561	4,206	1,363,067	144,390	784,831	50,452	437,741	156,671	1,574,011	115.5	—210,944	—289,297	—220,928	—682,172
Boston & Maine	May	2,081	2,493,367	478,390	3,487,134	380,167	462,824	64,841	1,281,187	165,703	2,359,495	67.7	1,127,639	896,778	751,238	699,285
	5 mos.	2,081	10,879,118	2,583,797	15,966,567	1,903,995	2,511,253	300,151	6,510,892	848,202	12,109,423	75.8	3,857,144	2,758,559	2,130,287	3,023,440
Brooklyn Eastern Dist. Term	May	11	94,880	.....	96,006	3,800	8,119	270	24,176	6,210	42,575	44.3	53,431	47,360	47,360	20,868
	5 mos.	11	345,252	.....	349,728	24,084	35,162	1,155	108,484	32,452	201,337	57.6	146,391	117,095	117,095	120,559
Burlington Rock Island	May	280	73,238	652	77,533	10,035	9,130	3,084	32,403	7,456	62,108	80.1	15,425	10,459	—636	—26,250
	5 mos.	280	306,425	3,053	327,184	48,085	47,362	15,632	179,687	36,103	326,869	99.9	315	—24,852	—76,250	—80,910
Cambria & Indiana	May	37	84,475	.....	84,676	11,791	40,706	359	10,779	7,390	71,025	83.88	13,651	4,433	45,371	45,708
	5 mos.	37	498,570	.....	499,572	34,319	203,856	1,902	56,753	37,440	334,270	66.91	165,302	95,406	375,428	351,655
Canadian Pacific Lines in Maine	May	233	92,361	10,440	111,922	38,372	20,816	4,167	47,905	3,525	114,785	102.6	—2,863	—10,863	—29,511	—68,342
	5 mos.	233	719,380	68,151	839,661	112,462	154,849	21,055	331,097	18,935	638,398	76.0	201,263	161,261	55,115	—6,381
Canadian Pacific Lines in Vermont	May	85	48,833	7,230	71,332	15,844	17,121	1,874	47,991	2,638	85,468	119.8	—14,136	—19,636	—35,854	—72,706
	5 mos.	85	198,597	47,827	316,376	64,216	86,773	9,553	250,136	12,920	423,598	133.9	—107,222	—134,725	—220,117	—223,041
Central of Georgia	May	1,944	870,597	74,467	1,066,565	145,476	209,976	50,113	400,698	68,590	877,449	82.3	189,116	118,791	96,159	—63,160
	5 mos.	1,944	3,737,362	397,385	4,693,207	592,525	991,692	241,422	1,962,699	338,702	4,149,803	88.4	543,404	86,049	—40,617	34,480
Central New Jersey	May	691	1,603,990	330,839	2,097,106	156,363	422,689	44,630	902,021	93,302	1,630,363	77.7	466,743	119,959	33,420	6,080
	5 mos.	691	8,232,725	1,659,731	10,623,452	759,067	1,998,868	199,244	4,377,101	468,952	7,864,264	74.0	2,759,188	1,532,673	1,160,012	1,570,254
Central Vermont	May	457	378,990	23,541	449,512	109,724	92,195	13,487	188,391	20,460	424,332	94.4	25,180	9,541	1,040	—1,426
	5 mos.	457	1,477,547	163,785	1,851,622	328,415	428,556	68,523	882,981	100,730	1,809,558	97.7	42,064	—36,114	—48,917	17,352
Chesapeake & Ohio	May	3,148	7,812,148	222,977	8,380,632	945,649	1,415,361	151,918	1,868,152	269,163	4,659,511	55.6	3,721,121	2,960,945	2,728,935	2,263,073
	5 mos.	3,145	36,099,581	918,365	38,403,595	4,316,069	6,993,552	755,944	9,073,120	1,397,256	22,593,867	58.8	15,809,728	12,015,388	11,524,283	11,529,845
Chicago & Eastern Illinois	May	938	747,139	68,664	916,979	122,518	116,365	47,757	410,082	50,440	753,196	82.1	163,783	88,566	—31,456	—199,856
	5 mos.	938	3,726,702	349,850	4,530,661	588,092	692,636	255,873	2,079,407	271,247	3,916,557	86.4	614,104	187,255	—412,467	—732,865

Continued on next left-hand page

BUY A GEAR THAT SERVICE HAS PROVED

The Power Reverse Gear with Trunk Type Piston *Eliminating Crosshead and Guides*

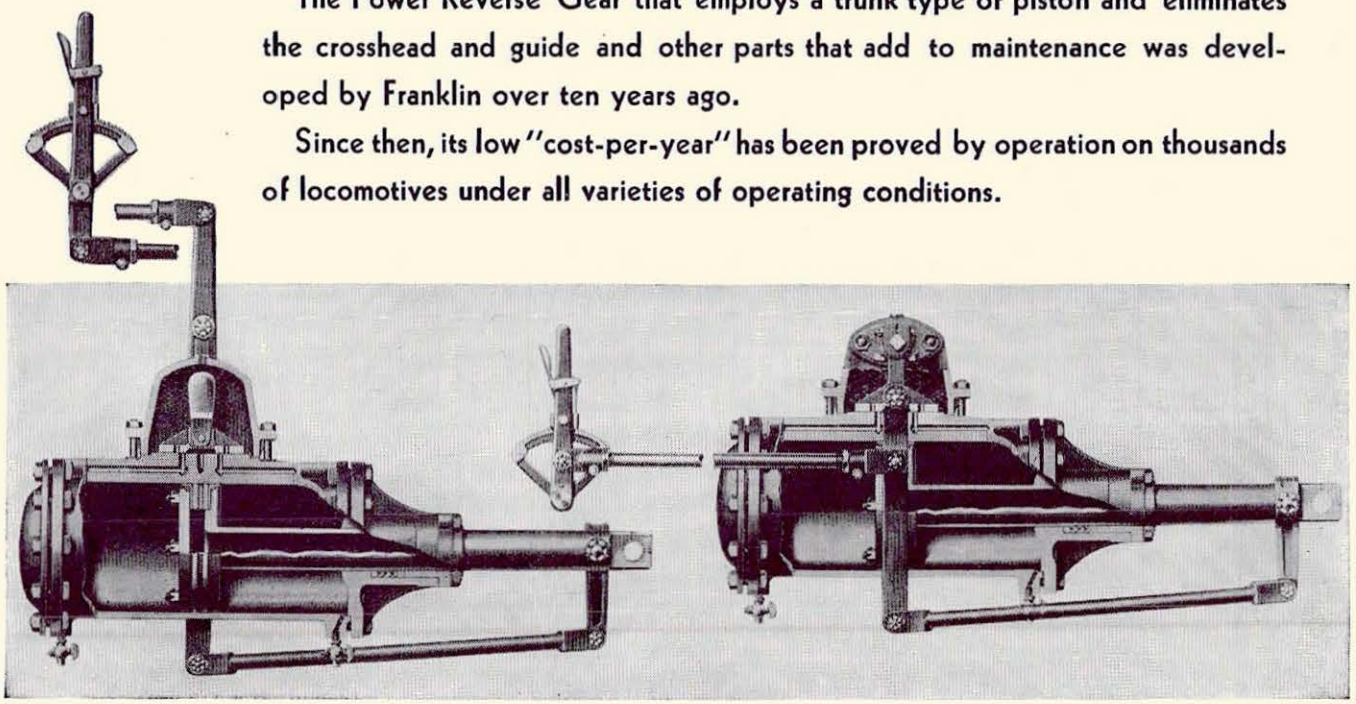
— Developed by Franklin

— For Ten Years Made by Franklin

— Proved on Thousands of Locomotives

The Power Reverse Gear that employs a trunk type of piston and eliminates the crosshead and guide and other parts that add to maintenance was developed by Franklin over ten years ago.

Since then, its low "cost-per-year" has been proved by operation on thousands of locomotives under all varieties of operating conditions.



FRANKLIN IS PREPARED TO FURNISH THE TYPE OF GEAR BEST SUITED TO EACH APPLICATION

HERE ARE THE DESIGN FEATURES

A balanced slide valve is used. Every air man is familiar with this type and understands the little maintenance required.

Crossheads and guides are eliminated, thus reducing weight, number of parts for stock and over-all dimensions.

The piston trunk and front head are proportioned to care for all side and vertical stresses at low unit bearing pressures. The self-adjusting piston rod packing requires no attention between shoppings.

The seal between the Rocker Arm and the Valve Chest is accomplished by a metallic joint. This is an advantage over soft packing.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

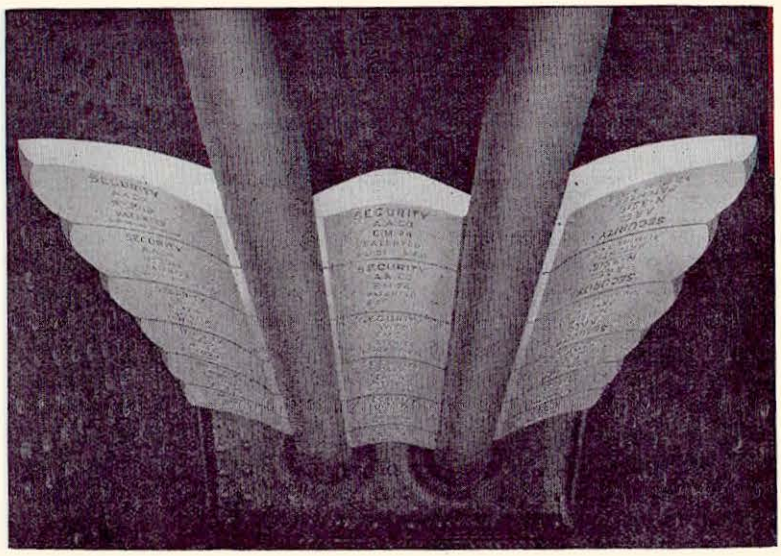
NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Chicago & Illinois Midland	May	131	$219,941	$894	$229,591	$20,957	$41,913	$16,207	$52,441	$15,121	$148,055	64.5	$81,536	$74,978	$80,506	—$36,586
	5 mos.	131	1,105,988	5,396	1,147,997	110,252	224,936	79,599	287,809	76,925	781,118	68.0	366,879	324,469	340,701	195,834
Chicago & North Western	May	8,442	4,879,556	618,321	6,154,535	1,226,146	1,203,048	139,520	2,302,976	262,219	5,156,546	83.8	997,989	422,248	173,424	—597,535
	5 mos.	8,442	19,684,210	2,940,450	25,603,624	3,389,282	6,242,182	711,915	11,207,243	1,328,492	23,008,158	89.9	2,595,466	—410,408	—1,529,519	—786,935
Chicago, Burlington & Quincy	May	9,248	5,262,767	411,144	6,398,348	724,673	1,028,865	212,341	2,169,849	283,211	4,465,990	69.8	1,932,358	1,263,208	996,436	162,214
	5 mos.	9,248	22,071,273	2,011,193	27,299,440	2,519,825	4,770,215	969,482	10,820,540	1,416,931	20,700,538	75.8	6,598,902	3,240,604	1,817,032	3,959,985
Chicago Great Western	May	1,499	1,154,283	31,938	1,274,600	154,518	157,979	49,068	445,268	44,490	849,681	66.7	424,919	360,229	175,889	47,384
	5 mos.	1,499	4,683,725	161,263	5,217,431	758,376	814,667	249,306	2,194,071	232,795	4,242,231	81.3	975,200	666,607	—258,010	433,591
Chicago, Indianapolis & Louisville	May	647	493,360	43,513	608,290	60,000	132,000	21,000	248,000	20,000	484,200	79.6	124,090	90,540	3,540	—87,931
	5 mos.	647	2,204,748	195,326	2,724,832	236,843	639,397	102,576	1,224,866	116,774	2,341,271	85.9	383,561	194,071	—226,415	—246,852
Chicago, Mil., St. Paul & Pacific	May	11,242	6,468,119	395,383	7,564,422	636,245	1,394,712	194,444	2,564,761	245,537	5,063,007	66.9	2,501,415	1,874,235	1,454,881	—1,248,602
	5 mos.	11,242	26,247,934	1,683,280	31,034,284	2,809,044	6,782,288	992,243	12,574,394	1,285,814	24,580,307	79.2	6,453,977	3,138,514	1,086,554	—1,458,800
Chicago River & Indiana	May	20	.....	.....	390,223	10,000	23,000	1,555	115,789	8,961	159,305	40.8	230,918	207,068	268,818	187,463
	5 mos.	20	.....	.....	1,694,875	56,500	106,000	7,194	549,284	51,486	770,464	45.5	924,411	807,334	1,076,962	1,019,691
Chicago, Rock Island & Pacific	May	7,611	4,259,692	386,775	5,175,728	426,572	980,253	154,492	1,965,115	239,744	3,820,413	73.8	1,355,315	889,892	634,284	129,380
	5 mos.	7,611	18,901,412	1,922,072	23,162,948	2,106,916	4,877,106	835,000	9,956,377	1,271,408	19,313,860	83.4	3,849,088	1,520,255	122,612	976,890
Chicago, Rock Island & Gulf	May	721	263,584	15,671	282,662	35,778	28,311	13,371	96,611	17,550	194,092	68.7	88,570	68,229	—17,708	—12,638
	5 mos.	721	1,230,544	86,918	1,311,302	154,130	158,427	73,570	481,130	89,507	968,248	73.8	343,054	236,525	—142,438	218,142
Chic., St. Paul, Minn. & Omaha	May	1,691	1,105,140	89,581	1,291,754	136,000	191,092	31,619	502,039	65,689	934,045	72.3	357,709	280,913	209,578	—129,723
	5 mos.	1,727	4,159,783	462,285	5,026,579	559,012	835,522	153,056	2,537,396	325,941	4,442,974	88.4	583,605	193,439	—132,384	—444,010
Cincinnati Union Terminal	May	45	.....	.....	4,108	8,961	5,419	.....	85,527	5,638	105,545	—256.93	—101,437	—129,524	—130,755	Not Given
	5 mos.	45	.....	.....	9,121	19,515	9,751	.....	167,409	11,056	207,731	—227.75	—198,610	—254,772	—257,211	Not Given
Clinchfield R. R.	May	309	372,249	1,612	378,703	34,248	82,143	15,734	62,961	12,280	207,366	54.8	171,337	116,337	126,257	33,567
	5 mos.	309	1,814,120	9,126	1,846,341	166,022	399,745	76,546	321,611	65,255	1,029,179	55.7	817,162	541,924	593,748	325,440
Colorado & Southern	May	1,030	305,691	17,086	366,923	49,840	105,236	10,644	155,848	32,650	354,469	96.6	12,454	—45,024	—55,262	—108,200
	5 mos.	1,030	1,514,545	94,291	1,818,769	200,085	469,108	57,207	804,208	158,349	1,686,736	92.7	132,033	—152,250	—222,254	—190,891
Ft. Worth & Denver City	May	804	324,490	23,269	409,665	28,032	60,474	15,710	131,343	31,947	268,610	65.6	141,055	113,919	90,083	11,708
	5 mos.	804	1,465,759	126,413	1,887,538	116,998	322,811	75,845	644,426	161,712	1,326,342	70.3	561,196	424,655	309,767	363,036
Columbus & Greenville	May	167	55,949	3,531	63,636	8,240	7,408	2,976	21,874	7,937	48,435	76.1	15,201	13,359	16,607	143
	5 mos.	167	224,601	15,675	262,316	54,038	42,741	13,765	114,494	39,563	264,601	100.9	—2,285	—9,572	—1,033	—10,196
Conemaugh & Black Lick	May	20	20,927	.....	39,752	6,440	7,125	280	18,719	3,019	35,583	89.5	4,169	3,869	5,040	—7,709
	5 mos.	20	68,379	.....	138,821	22,172	33,059	1,402	71,411	12,969	141,013	101.6	—2,192	—3,692	2,692	—28,830
Delaware & Hudson	May	848	1,438,634	68,870	1,627,189	252,083	469,586	48,938	688,149	134,045	1,596,667	98.1	30,522	—50,014	—52,908	65,518
	5 mos.	853	7,010,609	387,407	7,913,664	1,318,818	2,447,022	240,276	3,660,504	676,991	8,346,374	105.5	—432,710	—845,402	—777,308	214,718
Delaware, Lackawanna & Western	May	998	2,465,785	502,917	3,480,784	383,513	642,697	110,558	1,473,057	145,161	2,781,186	79.9	699,598	299,255	254,485	564
	5 mos.	998	11,650,579	2,527,802	16,544,384	1,441,433	3,598,147	540,310	7,679,795	762,048	14,148,096	85.5	2,396,288	354,434	194,803	1,998,724
Denver & Rio Grande Western	May	2,513	1,161,575	55,417	1,304,093	120,428	294,189	41,891	422,182	70,516	948,072	72.7	356,021	220,848	215,414	—4,584
	5 mos.	2,513	5,064,781	242,352	5,682,862	595,958	1,446,680	218,031	2,004,074	363,458	4,638,912	81.6	1,043,950	316,264	385,318	151,402
Denver & Salt Lake	May	232	108,420	4,277	122,422	16,409	22,958	1,393	24,447	11,860	71,428	58.3	50,994	36,994	52,126	2,233
	5 mos.	232	457,435	23,540	531,435	77,206	110,649	7,514	113,419	56,771	358,435	67.4	173,000	102,732	140,839	234,124
Detroit & Mackinac	May	242	49,813	1,339	57,069	16,710	7,369	925	21,305	3,727	50,007	87.6	7,062	20,959	21,267	12,839
	5 mos.	242	171,836	8,653	207,769	45,679	35,445	5,005	105,079	17,394	208,557	100.4	—788	—10,067	—10,940	—11,760
Detroit & Toledo Shore Line	May	50	189,972	.....	191,335	20,490	18,296	6,391	49,294	8,056	102,527	53.6	88,808	71,276	36,230	—2,512
	5 mos.	50	1,037,350	.....	1,043,814	82,499	97,628	31,272	266,989	38,971	517,358	49.6	526,456	424,287	228,392	198,028
Detroit Terminal	May	19	.....	.....	54,415	4,941	7,363	.....	27,074	2,536	41,914	77.0	12,501	2,999	5,138	—10,690
	5 mos.	19	.....	.....	255,015	21,196	37,499	.....	140,085	13,089	211,869	83.1	43,146	—11,114	—20,746	—32,414
Detroit, Toledo & Ironton	May	472	285,615	245	298,154	34,407	53,624	8,894	85,800	16,747	197,329	66.2	100,825	66,467	59,845	78,440
	5 mos.	472	1,433,019	1,144	1,479,825	125,796	258,846	45,890	423,404	90,118	937,315	63.3	542,510	374,255	309,926	235,995
Duluth, Missabe & Northern	May	563	626,450	1,387	712,843	96,301	123,737	2,717	163,421	40,041	426,217	59.8	286,626	248,517	248,613	—337,290
	5 mos.	563	826,708	5,531	969,961	384,460	643,651	14,576	612,529	201,999	1,857,215	191.5	—887,254	—947,843	—949,352	—1,821,093
Duluth, Winnipeg & Pacific	May	178	47,439	1,213	51,024	21,587	13,943	2,357	30,954	4,797	73,672	144.4	—22,648	—25,620	—9,549	—4,572
	5 mos.	178	246,225	6,768	266,217	91,832	99,776	11,590	163,066	21,435	387,679	145.6	—121,462	—135,360	—43,139	33,858
Elgin, Joliet & Eastern	May	446	746,594	1	822,176	73,413	169,811	11,113	285,781	39,169	579,181	70.4	242,995	141,414	100,777	—131,502
	5 mos.	446	2,945,446	1	3,161,545	331,868	764,848	56,996	1,311,007	218,688	2,683,289	84.9	478,256	—25,989	—197,759	—349,441
Erie Railroad	May	2,046	4,468,831	407,632	5,315,054	494,032	1,033,325	133,725	1,801,300	226,922	3,695,208	69.5	1,619,846	1,277,416	1,177,366	644,274
	5 mos.	2,046	19,417,998	2,034,669	23,462,653	2,143,446	5,260,359	646,936	9,030,515	1,164,888	18,291,418	78.0	5,171,235	3,454,534	2,955,984	3,359,314

Continued on next left-hand page



Brick + Design + Service = *A Satisfactory* ARCH BRICK *Supply*

THREE elements — good brick, sound design and conscientious servicing taken together constitute a satisfactory Arch Brick supply.

Arch Brick supplied by American Arch Company come from the following picked manufacturers:

HARBISON-WALKER REFRACTORIES CO.
Pennsylvania
Ohio
Kentucky
Alabama
Missouri

NORTH AMERICAN REFRACTORIES CO.
Pennsylvania
Kentucky

IRONTON FIRE BRICK CO.
Ohio

DENVER SEWER PIPE & CLAY CO.
Colorado

ATHENS BRICK & TILE CO.
Texas

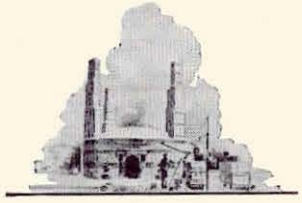
MOULDING-BROWNELL CORP.
Ohio

GLADDING-McBEAN & CO.
California
Washington

DIAMOND FIRE BRICK CO.
Colorado

DOMINION FIRE BRICK & CLAY PRODUCTS LTD.
Saskatchewan, Canada

CANADA FIRE BRICK CO., LTD.
Ontario, Canada
Quebec, Canada



There's More to
SECURITY ARCHES
Than Just Brick

Sound design and satisfactory servicing are guaranteed by the 23 years which American Arch Company has devoted to these activities.

American Arch Company, alone, possesses all three essentials.

AMERICAN ARCH COMPANY

INCORPORATED

Locomotive Combustion Specialists

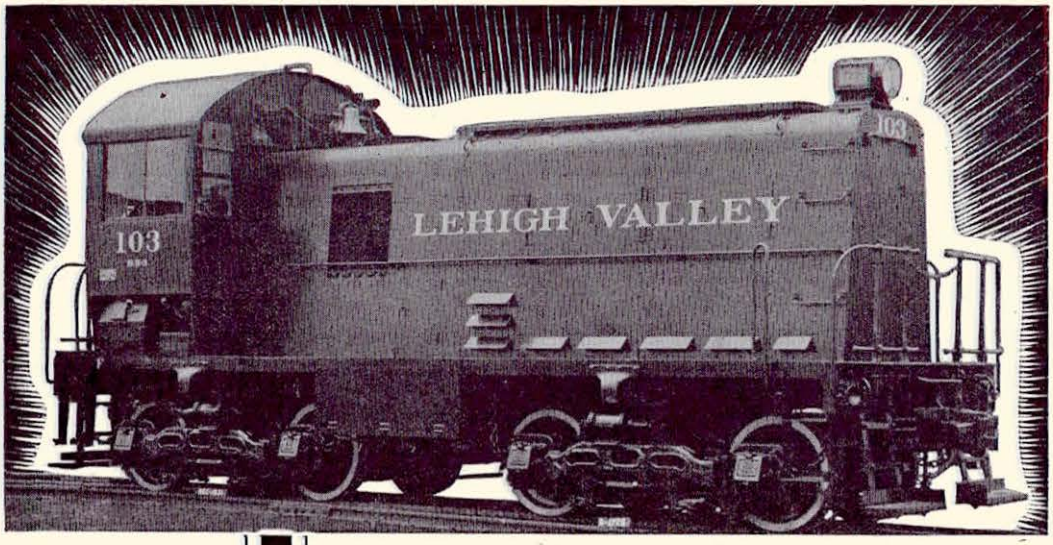
NEW YORK CHICAGO

Revenues and Expenses of Railways

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Maintenance of—Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Chicago & Erie	May	269	$641,833	$15,378	$702,513	$83,011	$88,028	$21,780	$181,117	$31,477	$405,366	57.7	$297,147	$261,386	$73,952	—$49,240
	5 mos.	269	3,018,053	65,518	3,284,541	338,187	437,291	110,493	934,119	163,027	1,980,860	60.3	1,303,681	1,124,399	182,041	—31,060
New Jersey & New York	May	45	15,486	61,181	78,667	7,247	26,939	1,497	45,513	3,261	84,457	107.4	—5,790	—10,836	—28,636	—18,450
	5 mos.	45	75,604	323,348	407,772	37,943	120,569	7,022	241,321	16,897	423,752	103.9	—15,980	—41,045	—134,156	—101,293
N. Y. Susquehanna & Western	May	131	216,972	27,256	256,530	23,496	52,181	4,491	96,135	10,321	186,623	72.7	69,907	39,722	25,596	69,453
	5 mos.	131	1,078,552	135,481	1,281,169	115,704	243,057	21,762	520,780	52,246	953,548	74.4	327,621	176,246	103,705	177,835
Florida East Coast	May	839	476,631	77,589	639,577	99,859	126,666	18,245	159,333	39,912	447,895	70.0	191,682	116,405	62,410	—47,361
	5 mos.	839	2,757,284	954,548	4,143,220	505,029	663,152	102,468	951,946	199,057	2,451,153	59.2	1,692,067	1,315,875	1,058,863	767,723
Ft. Smith & Western	May	249	46,398	821	50,972	13,206	8,458	4,097	17,525	3,858	47,292	92.8	3,680	1,680	—3,674	—13,402
	5 mos.	249	230,719	4,195	254,318	63,461	48,619	21,509	91,268	20,506	246,106	96.8	8,212	—3,691	—20,850	—48,806
Galveston Wharf	May	11	.....	.....	95,098	31,042	3,293	3,892	23,108	5,040	69,997	73.6	25,101	5,087	5,184	13,291
	5 mos.	11	.....	.....	442,751	153,090	16,344	15,441	97,362	29,245	330,667	74.7	112,084	11,997	12,158	189,069
Georgia R. R.	May	329	232,219	11,705	264,830	26,696	40,648	16,109	105,135	12,624	201,644	76.1	63,186	57,262	65,305	20,871
	5 mos.	329	1,081,094	55,977	1,229,796	135,760	224,803	80,001	537,552	62,959	1,042,204	84.8	187,592	158,080	192,727	58,929
Georgia & Florida	May	463	64,098	1,109	70,092	13,802	14,422	7,864	30,482	6,082	72,819	103.9	—2,727	—7,933	—6,721	—27,485
	5 mos.	463	306,536	5,009	333,981	78,005	68,497	40,462	153,089	32,130	373,074	111.7	—39,093	—64,299	—74,446	—111,792
Grand Trunk Western	May	1,002	1,191,017	46,625	1,322,830	253,152	278,380	36,361	555,073	81,470	1,205,404	91.1	117,426	46,306	—27,632	—183,003
	5 mos.	1,002	5,258,983	221,761	5,899,919	885,169	1,358,063	178,780	2,699,508	380,899	5,512,465	93.4	387,454	—57,219	—549,201	—754,284
Canadian Nat'l Lines in New Eng.	May	172	60,519	5,731	75,291	20,875	12,605	3,132	57,294	8,701	103,113	136.9	—27,822	—41,938	—75,061	—95,954
	5 mos.	172	313,050	31,672	393,378	82,045	82,099	15,218	263,484	42,847	493,578	125.5	—100,200	—170,848	—347,963	—420,674
Great Northern	May	8,452	4,133,991	229,075	4,782,182	390,242	827,453	170,446	1,500,340	180,475	3,109,302	65.0	1,672,880	1,109,081	1,001,883	—775,271
	5 mos.	8,453	16,200,470	1,097,502	19,233,041	1,732,887	4,353,054	777,607	7,855,727	929,497	15,807,127	82.2	3,425,914	692,894	—144,986	—2,387,250
Green Bay & Western	May	234	86,390	791	89,820	20,670	12,960	4,571	40,278	2,617	81,090	90.2	8,730	3,730	3,056	604
	5 mos.	234	398,590	4,428	415,892	85,518	58,945	21,986	193,154	12,876	372,230	89.5	43,662	14,662	9,600	13,213
Gulf & Ship Island	May	307	73,149	4,927	91,892	13,072	15,476	1,851	39,020	4,402	73,821	80.3	18,071	926	—10,653	—29,652
	5 mos.	307	367,678	31,529	453,343	53,189	81,243	10,243	213,415	19,381	378,770	83.6	74,573	—16,623	—77,088	—107,284
Gulf, Mobile & Northern	May	733	285,076	5,504	303,977	34,811	50,547	22,191	87,432	15,170	210,151	69.13	93,826	72,816	47,920	—33,673
	5 mos.	733	1,168,753	34,562	1,271,405	164,361	202,484	99,068	423,789	77,566	967,268	76.08	304,137	198,924	92,550	—85,985
Illinois Central	May	5,014	5,045,465	551,107	6,352,103	504,761	1,176,052	134,145	2,279,073	310,817	4,429,284	69.7	1,922,819	1,514,592	1,311,372	627,727
	5 mos.	5,014	23,097,136	2,677,572	28,490,117	1,899,871	5,957,622	758,206	11,015,560	1,354,451	21,120,443	74.1	7,369,674	5,023,364	4,339,474	4,703,481
Yazoo & Mississippi Valley	May	1,673	852,342	43,782	981,408	65,388	115,866	18,267	354,360	46,258	601,247	61.3	380,161	274,208	167,072	—79,812
	5 mos.	1,673	3,699,987	236,503	4,289,787	273,724	645,886	102,381	1,845,490	193,414	3,063,372	71.4	1,226,415	601,420	94,013	—124,150
Illinois Central System	May	6,687	5,897,807	594,889	7,333,511	570,149	1,291,918	152,412	2,633,433	357,075	5,030,531	68.6	2,302,980	1,788,800	1,478,444	547,915
	5 mos.	6,687	26,797,123	2,914,075	32,779,904	2,173,595	6,603,508	860,587	12,861,050	1,547,865	24,183,815	73.8	8,596,089	5,624,784	4,433,487	4,579,331
Illinois Terminal	May	540	323,961	48,004	384,725	44,818	47,662	14,180	136,354	16,844	259,858	67.54	124,867	101,300	73,321	21,702
	5 mos.	542	1,469,920	235,073	1,766,244	185,478	240,702	71,200	689,802	85,915	1,272,906	72.07	493,338	375,262	237,625	233,814
Kansas City Southern	May	783	622,487	14,877	735,646	74,289	130,983	40,531	218,878	63,050	528,779	71.9	206,867	130,734	113,001	26,372
	5 mos.	783	2,852,161	62,791	3,327,517	333,577	590,509	194,931	1,069,235	296,416	2,490,151	74.8	837,366	455,858	363,539	380,479
Texarkana & Ft. Smith	May	98	75,160	1,178	98,293	2,336	6,282	5,463	25,233	8,075	47,805	48.6	50,488	42,764	24,546	18,963
	5 mos.	98	303,947	4,770	374,922	35,051	30,471	26,824	124,158	40,406	261,196	69.7	113,726	755,543	—14,648	—1,219
Kansas, Oklahoma & Gulf	May	326	146,030	345	149,800	19,711	10,033	6,902	33,271	7,781	77,695	51.9	72,105	52,459	37,214	20,530
	5 mos.	326	653,386	1,452	668,393	68,646	55,488	33,282	171,651	38,214	367,020	54.9	301,373	220,153	154,084	160,995
Lake Superior & Ishpeming	May	160	50,664	42	56,297	19,305	11,171	561	17,536	5,631	54,204	96.3	2,093	8,255	7,003	—41,043
	5 mos.	160	132,214	381	144,139	77,962	61,106	2,481	77,096	27,435	246,080	170.7	—101,941	—145,844	—150,471	—214,726
Lake Terminal	May	12	.....	.....	59,036	5,067	4,356	.....	19,222	2,527	31,172	52.8	27,864	25,031	27,723	—4,277
	5 mos.	12	.....	.....	150,876	16,037	19,953	.....	71,347	12,569	119,908	79.5	30,968	16,803	16,787	—27,758
Lehigh & Hudson River	May	96	113,171	194	121,138	9,125	19,118	3,578	40,113	5,955	77,889	64.3	43,249	32,804	18,456	7,307
	5 mos.	96	522,681	1,261	561,910	46,335	99,166	16,412	199,737	31,459	393,109	70.0	168,801	111,650	53,907	41,168
Lehigh & New England	May	228	226,185	396	229,278	25,624	45,541	4,852	85,838	15,120	176,970	77.2	52,308	43,567	47,613	10,925
	5 mos.	228	1,118,258	2,075	1,130,821	131,741	243,755	25,578	443,511	81,866	926,437	81.9	204,384	166,535	210,303	311,355
Lehigh Valley	May	1,359	2,484,535	163,613	2,901,828	274,103	634,277	105,496	1,303,851	118,121	2,448,395	84.4	453,433	193,476	78,780	113,062
	5 mos.	1,360	12,165,963	857,975	14,230,649	1,063,884	3,227,804	533,222	6,521,585	617,996	12,029,626	84.5	2,201,023	900,094	336,423	1,475,222
Louisiana & Arkansas	May	608	353,287	6,167	384,425	50,411	64,831	20,182	84,409	20,564	240,768	62.6	143,657	113,706	76,881	33,792
	5 mos.	608	1,488,615	34,995	1,640,229	176,687	282,199	98,556	393,493	86,188	1,035,047	63.1	605,182	453,058	362,577	251,570
Louisiana, Arkansas & Texas	May	255	62,864	243	69,223	17,003	6,491	3,167	22,495	4,480	53,636	77.5	15,587	13,065	1,660	—12,427
	5 mos.	255	266,252	1,143	295,595	81,482	36,806	16,054	118,199	21,521	274,062	92.7	21,533	10,154	—42,678	—37,218

Continued on next left-hand page



300 H. P.
Total Weight
131,000 lb.
Tractive Power, Starting,
39,300 lb.

ALCO DIESEL LOCOMOTIVES

THE Alco Diesel Locomotive is much more than just another Oil-Electric.

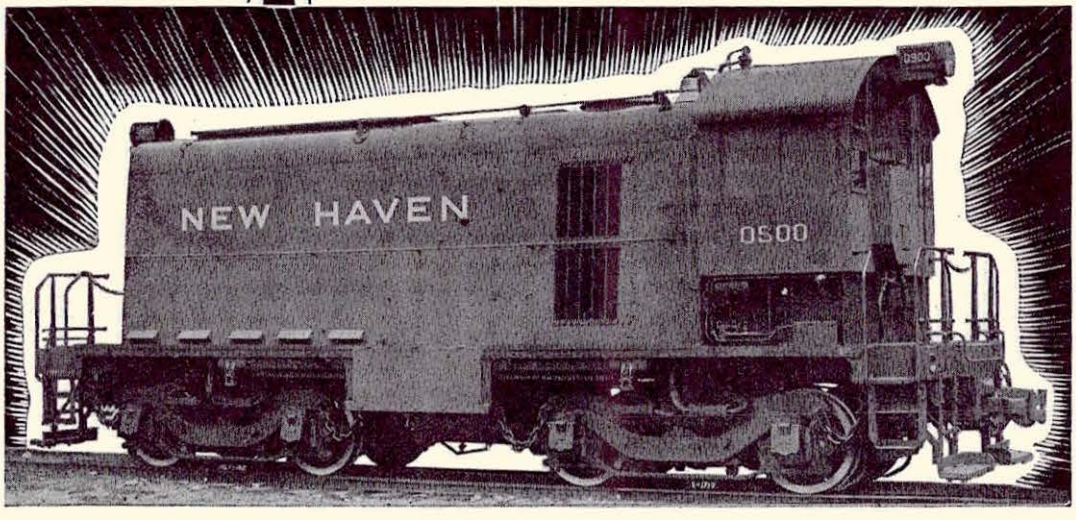
Designed and built by an organization which has been cooperating with railway officials on locomotive design, almost since railroads were new, it naturally followed that the fullest consideration was given to the railroad man's operating and maintenance problems.

Therefore, when considering this new class of motive power, do not overlook ease of operation and maintenance.

These are important and attractive features of the Alco Diesel Locomotive.

American Locomotive Company

30 Church Street New York N.Y.



600 H. P.
Total Weight
200,000 lb.
Tractive Power, Starting,
60,000 lb.

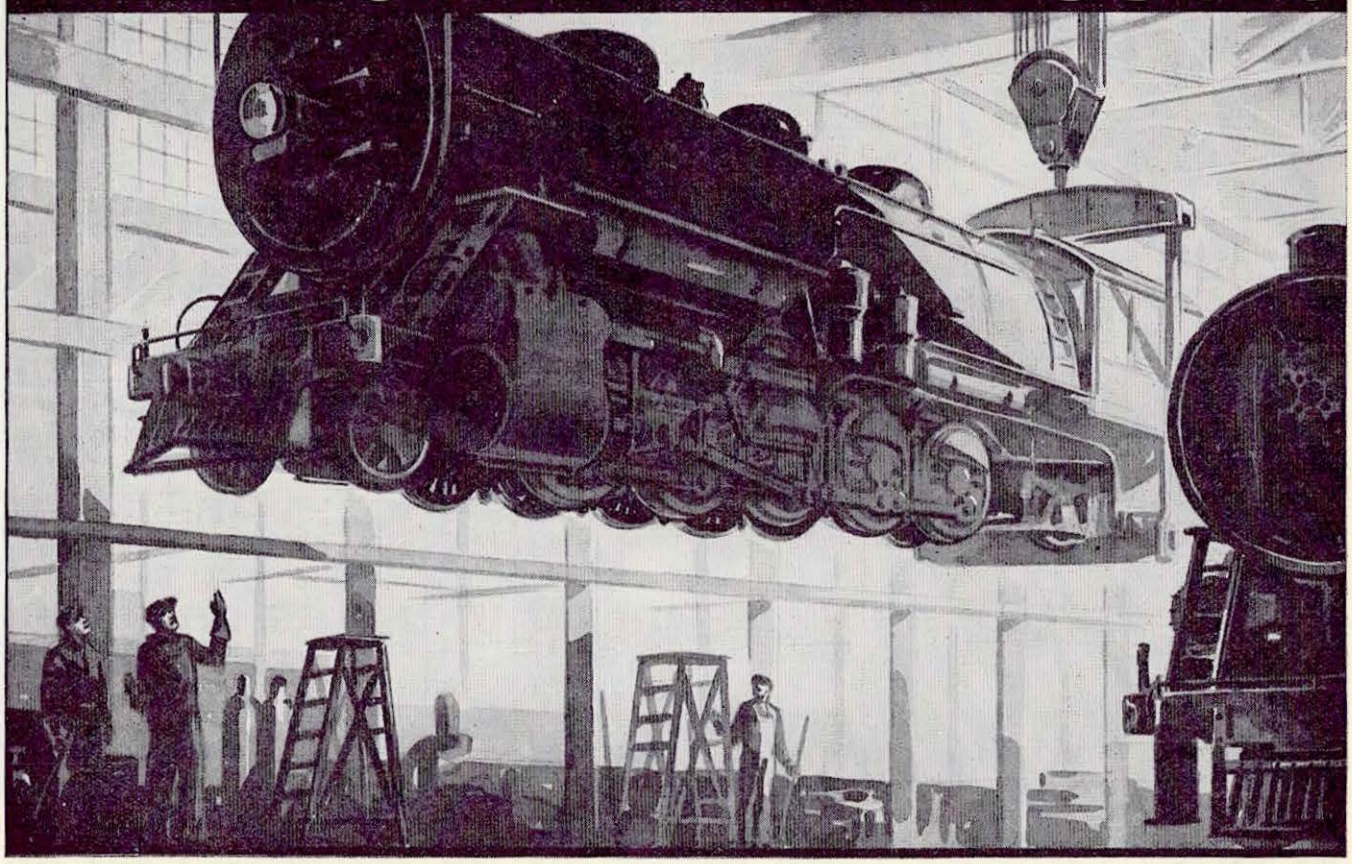
Revenues and Expenses of Railways

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of- Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Louisville & Nashville	May	5,125	$4,614,584	$346,938	$5,467,199	$599,543	$1,120,672	$164,729	$1,857,919	$267,459	$4,038,897	73.9	$1,428,302	$1,050,977	$945,131	—$39,274
	5 mos.	5,161	21,014,931	1,660,913	24,725,526	2,851,479	5,383,046	837,555	9,150,401	1,299,245	19,655,958	79.5	5,069,568	3,185,361	3,134,656	986,468
Maine Central	May	1,117	764,269	65,547	926,812	149,690	118,820	8,041	313,602	38,661	628,814	67.8	297,998	251,164	219,342	188,424
	5 mos.	1,117	3,300,665	325,947	4,055,389	507,306	621,197	50,629	1,623,552	188,845	2,990,942	73.8	1,064,447	830,368	642,906	569,119
Midland Valley	May	363	103,937	313	108,245	17,148	10,989	2,112	26,771	6,912	63,932	59.1	44,313	35,863	32,555	13,479
	5 mos.	363	504,252	2,022	525,397	71,348	50,947	11,763	140,738	34,275	309,044	58.8	216,353	169,604	137,092	148,047
Minneapolis & St. Louis	May	1,627	610,330	11,183	662,823	83,403	123,583	24,016	284,534	31,126	546,588	82.5	116,235	75,831	60,892	—163,355
	5 mos.	1,627	2,516,848	61,506	2,769,604	290,741	664,664	138,811	1,430,143	179,294	2,699,592	97.5	70,012	—123,235	—230,573	—350,160
Minn., St. Paul & S. S. Marie	May	4,315	1,692,156	59,751	1,892,499	286,939	317,423	59,207	706,066	110,065	1,482,845	78.4	409,654	259,321	126,339	—215,763
	5 mos.	4,332	6,683,582	320,565	7,661,627	1,166,874	1,723,075	296,408	3,573,834	540,080	7,310,736	95.4	350,891	—376,637	—946,519	—1,523,622
Duluth, South Shore & Atlantic	May	563	113,644	8,896	134,287	26,357	23,944	5,171	61,027	5,554	121,979	90.8	12,308	—3,024	—5,152	—71,288
	5 mos.	562	534,798	44,614	635,578	125,787	150,298	28,006	326,937	30,478	663,488	104.4	—27,910	—132,873	—152,254	—255,145
Spokane International	May	163	30,962	1,358	36,229	10,977	5,128	2,066	18,449	4,131	40,751	112.5	—4,522	—9,367	—10,768	—10,759
	5 mos.	163	125,155	7,798	150,544	54,914	22,628	10,006	93,976	20,688	202,212	134.3	—51,668	—75,909	—84,570	—77,325
Mississippi Central	May	150	47,447	988	50,299	20,307	11,031	6,184	14,863	5,031	57,419	114.2	—7,120	—9,798	—13,780	—15,613
	5 mos.	150	205,344	4,427	218,456	46,213	48,241	30,050	75,128	25,522	225,157	103.1	—6,701	—19,232	—37,181	—67,387
Missouri & North Arkansas	May	364	67,506	1,563	75,598	15,227	8,754	4,404	23,713	4,482	56,580	74.8	19,018	16,523	5,802	—17,084
	5 mos.	364	279,157	5,016	312,604	72,967	44,569	26,625	124,268	26,368	294,782	94.3	17,822	5,366	—34,706	—68,311
Missouri-Illinois	May	202	58,473	294	60,601	14,360	8,934	2,009	20,754	5,498	51,555	85.1	9,046	2,186	—3,913	—3,114
	5 mos.	202	292,062	1,629	301,788	60,536	61,899	11,932	108,367	27,535	270,199	89.5	31,589	406	—36,766	3,338
Missouri-Kansas-Texas Lines	May	3,293	1,719,105	139,105	2,079,929	262,125	342,909	105,738	683,568	137,816	1,542,771	74.2	537,158	321,633	161,178	67,846
	5 mos.	3,293	7,346,354	678,874	9,019,111	1,287,290	1,531,378	518,387	3,523,978	687,237	7,605,273	84.3	1,413,838	431,552	—384,001	684,077
Missouri Pacific	May	7,412	4,984,695	254,888	5,845,330	782,651	1,174,277	200,941	2,011,856	242,844	4,427,698	75.7	1,417,632	1,040,742	676,908	271,973
	5 mos.	7,412	21,206,279	1,346,369	24,975,575	2,881,921	5,191,700	1,028,587	9,791,132	1,278,248	20,235,571	81.0	4,740,004	2,915,757	1,315,882	2,577,601
Gulf Coast Lines	May	1,800	749,785	24,286	820,054	117,112	121,584	36,234	240,579	42,314	557,380	67.97	262,674	213,089	97,414	168,138
	5 mos.	1,802	3,501,883	138,154	3,844,322	494,080	610,694	192,045	1,209,694	230,553	2,723,809	70.85	1,120,513	870,274	326,051	876,764
International-Great Northern	May	1,159	1,298,294	44,231	1,418,608	167,769	232,299	25,131	414,743	41,427	884,829	62.37	533,779	496,509	297,010	90,687
	5 mos.	1,159	4,573,086	221,045	5,190,359	575,541	827,750	130,854	1,841,278	223,822	3,633,149	70.00	1,557,210	1,371,168	714,620	—41,999
San Antonio, Uvalde & Gulf	May	316	54,254	2,428	62,742	10,065	8,992	3,770	21,430	4,090	48,346	77.1	14,396	10,759	—9,003	—2,305
	5 mos.	316	275,042	14,482	313,456	70,658	53,349	19,827	92,762	21,843	257,656	82.2	55,800	36,677	—73,347	12,248
Mobile & Ohio	May	1,220	711,289	16,687	779,403	76,142	162,134	38,984	258,467	38,003	573,579	73.6	205,824	163,618	87,741	—61,584
	5 mos.	1,235	2,810,707	79,431	3,076,918	370,575	624,517	190,006	1,221,381	183,256	2,590,389	84.2	486,529	281,689	—27,676	—260,558
Monongahela	May	177	285,099	527	287,000	22,085	20,443	534	51,129	4,254	98,445	34.3	188,555	167,263	98,272	99,981
	5 mos.	177	1,242,442	3,100	125,169	89,569	107,728	3,973	268,814	39,276	509,378	40.6	743,791	676,497	345,384	444,846
Monongahela Connecting	May	6	.....	.....	56,647	10,576	14,120	45	28,532	2,640	55,913	98.7	734	—1,999	—1,558	—19,958
	5 mos.	6	.....	.....	195,286	43,704	69,430	225	124,377	13,155	250,891	128.5	—55,605	—77,837	—74,115	—107,685
Montour	May	57	140,798	.....	141,868	14,253	35,068	1,106	26,650	6,028	83,105	58.6	58,763	56,051	72,073	31,514
	5 mos.	57	557,840	.....	563,196	48,884	146,741	5,951	129,520	34,390	365,486	64.9	197,710	184,101	272,730	257,277
Nashville, Chatt. & St. Louis	May	1,203	969,069	54,018	1,130,511	146,375	234,087	53,316	389,333	55,173	882,605	78.1	247,906	213,095	198,737	—11,661
	5 mos.	1,203	4,195,668	294,374	4,997,416	673,460	1,102,050	273,575	1,909,556	269,857	4,248,912	85.0	748,504	579,914	502,585	75,045
Nevada Northern	May	165	15,292	1,272	20,190	8,365	3,920	604	7,128	3,211	23,228	115.1	—3,038	—10,311	—5,944	918
	5 mos.	165	72,662	6,816	98,448	42,586	20,236	3,594	37,382	16,490	120,288	122.2	—21,840	—58,783	—37,102	—19,735
Newburgh & South Shore	May	6	.....	.....	33,567	2,100	13,126	.....	14,170	3,672	33,068	98.5	499	—8,260	—2,969	—19,135
	5 mos.	6	.....	.....	208,907	18,779	88,809	.....	112,069	23,159	242,816	116.2	—33,909	—77,764	—60,549	—67,478
New Orleans Great Northern	May	262	146,377	5,742	156,981	15,509	26,086	10,067	39,739	6,319	97,720	62.3	59,261	49,361	20,754	—804
	5 mos.	262	626,133	28,377	674,478	53,551	87,269	56,311	189,752	33,594	420,477	62.3	254,001	204,398	89,037	40,890
New Orleans Terminal	May	20	2,006	.....	112,857	8,295	5,862	.....	28,750	1,018	43,925	38.9	68,932	57,043	45,403	56,085
	5 mos.	20	5,498	.....	555,656	38,290	27,122	.....	130,868	5,212	201,492	36.3	354,164	297,285	228,626	166,176
New York Central	May	11,440	16,376,135	3,798,984	23,253,326	1,840,052	4,503,571	477,743	8,164,816	932,806	16,179,108	69.6	7,074,218	4,623,599	3,293,124	—226,882
	5 mos.	11,440	73,159,884	18,672,955	105,846,562	8,673,508	21,655,885	2,313,124	40,630,478	4,903,950	79,546,395	75.2	26,300,167	14,111,603	8,108,547	7,293,254
Indiana Harbor Belt	May	120	.....	.....	638,096	18,500	80,000	3,140	235,322	15,449	358,027	56.1	280,069	226,394	182,325	96,622
	5 mos.	120	.....	.....	2,877,435	179,000	285,000	15,315	1,165,974	87,444	1,771,627	61.6	1,105,808	881,455	646,631	536,448
Pittsburgh & Lake Erie	May	231	1,039,733	39,229	1,125,366	69,910	379,584	24,355	376,996	63,675	915,670	81.4	209,696	114,299	221,166	76,825
	5 mos.	233	4,247,454	204,605	4,617,514	335,983	1,689,893	118,562	1,748,504	290,467	4,190,268	90.8	427,246	19,149	570,472	661,022
New York, Chicago & St. Louis	May	1,690	2,433,674	52,657	2,585,179	255,311	350,871	91,927	829,866	106,458	1,635,680	63.3	949,499	799,441	562,489	—45,783
	5 mos.	1,691	10,666,729	248,247	11,332,908	1,021,933	1,850,599	479,858	4,111,929	557,996	8,025,425	70.8	3,307,483	2,474,098	1,329,765	539,726

Continued on next left-hand page

IMPROVED MATERIALS WILL LOWER REPAIR COSTS



AT every shopping period, from a quarter to one-third of the original cost of the locomotive is spent for repairs. « Effective control of these expenditures is essential. « When every other economy has been enforced, there still remains the saving in future maintenance that can be had by using modern materials to extend the period between repairs. « Modern boiler tubes of Toncan Iron, due to their superior resistance to corrosion and their uniform quality, far outlast the old tubes. « Modern staybolts of Agathon Nickel Iron have the increased tensile strength required by present-day boiler pressures. They are doubling the mileage per staybolt renewal for progressive railroads. « Firebox sheets of Toncan Iron resist corrosion and fire-cracking. This alloy of refined iron, copper and molybdenum has substantially extended the life of side sheets. « In these and many other instances, Republic metallurgists have developed special alloy irons and steels that are improving locomotive performance and lowering maintenance.

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Staybolts, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Agathon Iron for pins and bushings • Agathon Staybolt Iron • Climax Steel Staybolts • Upson Bolts and Nuts • Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel.

The Birdsboro Steel Foundry & Machine Company of Birdsboro, Pa. has manufactured and is prepared to supply, under license, Toncan Copper Molybdenum Iron castings for locomotives.

CENTRAL ALLOY DIVISION, MASSILLON, OHIO

AGATHON NICKEL IRON

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

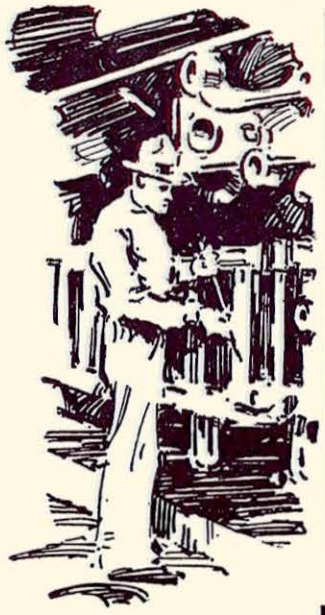
TONCAN COPPER MOLYBDENUM IRON

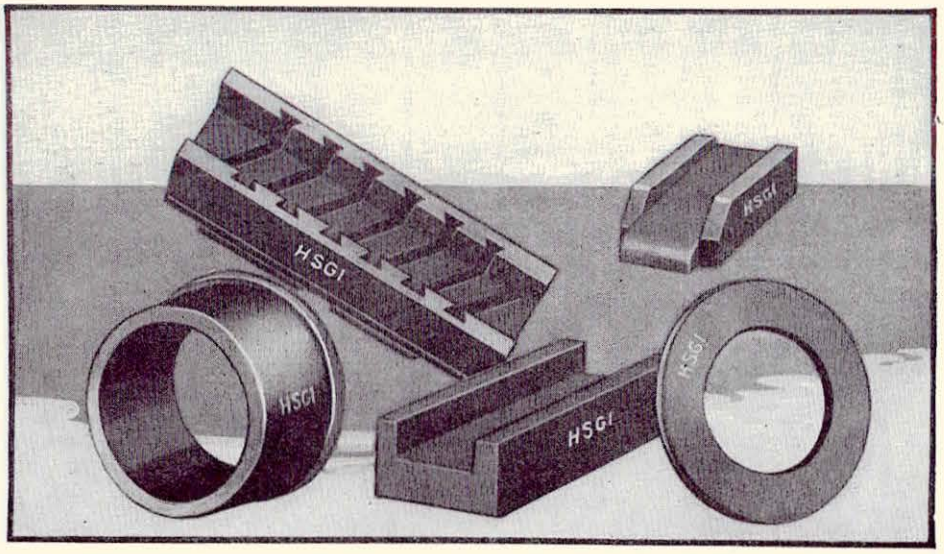
Revenues and Expenses of Railways

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Maintenance of—Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
N. Y., New Haven & Hartford	May	2,065	$3,282,827	$1,569,678	$5,528,757	$618,849	$965,773	$68,984	$2,034,026	$226,638	$4,026,606	72.8	$1,502,151	$1,126,725	$647,597	$986,972
	5 mos.	2,069	14,342,160	8,145,515	25,754,468	3,041,812	4,358,878	372,624	10,185,353	1,161,737	19,706,537	76.5	6,047,931	4,142,572	1,744,671	5,581,785
New York Connecting	May	20	222,301	.....	235,352	8,306	6,521	.....	25,531	925	41,283	17.5	194,069	163,209	122,509	28,759
	5 mos.	20	1,124,656	.....	1,174,190	42,731	34,499	.....	129,724	4,551	211,505	18.0	962,685	801,545	589,418	340,723
New York, Ontario & Western	May	568	582,151	24,429	689,289	82,439	129,944	12,242	274,871	22,062	522,172	75.8	167,117	128,504	101,029	141,767
	5 mos.	568	3,332,373	76,276	3,842,460	371,789	712,712	61,327	1,517,824	118,655	2,796,506	72.8	1,045,954	834,137	671,872	816,811
Norfolk & Western	May	2,224	4,976,759	116,474	5,257,790	546,266	1,005,403	110,719	1,182,178	210,316	3,059,016	58.2	2,198,774	1,648,608	1,682,871	1,091,481
	5 mos.	2,228	22,828,262	517,178	24,183,906	2,546,489	4,906,955	545,110	6,034,962	1,068,368	15,156,885	62.7	9,027,021	5,975,042	6,392,944	5,357,726
Norfolk Southern	May	932	353,870	9,914	382,889	72,719	60,117	19,047	145,891	22,628	320,402	83.7	62,487	24,171	6,245	—68,958
	5 mos.	932	1,469,443	34,864	1,587,244	353,247	296,700	96,150	700,074	112,549	1,558,720	98.2	28,524	—162,931	—227,341	—271,104
Northern Pacific	May	6,744	3,410,659	227,188	4,004,842	672,201	944,291	152,389	1,378,527	248,485	3,438,341	85.9	566,501	30,918	285,444	—61,299
	5 mos.	6,737	13,234,685	947,433	15,744,811	2,308,141	4,723,356	729,918	6,924,479	1,265,642	16,166,489	102.7	—421,678	—3,044,458	—1,761,973	—1,541,924
Northwestern Pacific	May	407	107,576	82,800	220,249	28,840	41,942	4,637	135,353	13,757	224,509	101.9	—4,260	—27,596	—30,380	—20,343
	5 mos.	417	432,260	354,662	918,174	175,041	209,654	23,210	609,291	72,074	1,086,318	118.3	—168,144	—281,821	—327,444	—333,798
Oklahoma City-Ada-Atoka	May	132	23,527	246	25,222	4,096	2,453	533	9,590	1,541	18,213	72.2	7,009	1,415	—5,301	2,525
	5 mos.	132	128,754	1,372	137,763	19,388	8,434	3,110	49,176	7,401	87,509	63.5	50,254	29,593	—2,876	—8,551
Pennsylvania R. R.	May	10,892	19,656,772	3,974,540	26,372,112	1,901,646	5,057,471	476,708	8,949,181	1,222,209	17,856,964	67.7	8,515,148	5,948,112	5,091,900	4,375,960
	5 mos.	10,892	86,162,984	20,142,501	119,186,686	9,449,304	23,624,138	2,512,688	44,652,733	6,241,049	87,560,503	73.5	31,626,183	20,969,513	16,621,219	20,660,350
Long Island	May	399	488,759	1,369,116	1,954,866	133,132	283,461	12,239	798,034	54,255	1,281,206	65.5	673,660	466,561	300,311	477,783
	5 mos.	399	2,342,940	6,407,138	9,259,514	706,820	1,369,241	56,151	4,166,501	268,605	6,567,422	70.9	2,692,092	1,990,780	1,146,569	1,638,009
Peoria & Pekin Union	May	18	13,205	.....	76,070	6,795	6,121	1,904	31,390	14,903	61,113	80.3	14,957	—568	19,055	32,690
	5 mos.	18	49,377	.....	341,628	38,361	33,162	9,125	155,617	42,765	279,030	81.7	62,598	—10,576	86,839	103,943
Pere Marquette	May	2,288	1,693,652	39,670	1,834,691	228,784	431,345	54,917	677,196	82,635	1,478,389	80.6	356,302	258,978	164,419	—104,337
	5 mos.	2,314	7,711,203	197,559	8,349,893	1,101,757	2,065,975	279,471	3,397,901	439,941	7,303,574	87.5	1,046,319	496,790	64,985	78,938
Pittsburg & Shawmut	May	102	47,362	464	48,368	7,704	13,681	1,388	13,811	3,939	40,523	83.8	7,845	7,109	6,804	4,683
	5 mos.	102	227,118	2,907	233,248	41,111	80,810	6,841	74,506	21,222	224,490	96.2	8,758	5,878	7,640	27,752
Pittsburgh & West Virginia	May	138	215,225	1	225,152	18,557	45,534	10,861	41,011	11,732	134,471	59.7	90,681	76,621	96,035	—8,431
	5 mos.	138	837,665	44	895,195	92,292	226,972	55,816	183,001	61,409	653,988	73.1	241,207	132,055	221,831	119,734
Pittsburg, Shawmut & Northern	May	195	63,809	320	70,702	15,489	15,046	1,234	23,749	6,388	61,906	87.5	8,796	6,602	3,751	2,640
	5 mos.	196	327,527	1,004	347,381	56,951	84,785	6,312	126,253	33,672	307,973	88.7	39,408	28,262	7,489	9,767
Reading	May	1,461	3,516,032	226,726	3,980,143	222,729	579,210	69,769	1,408,595	178,441	2,474,654	62.2	1,505,489	1,289,983	1,231,993	917,307
	5 mos.	1,461	16,498,745	1,165,800	18,890,104	1,083,694	3,699,144	343,608	7,363,457	911,249	13,477,829	71.3	5,412,275	4,351,171	4,055,649	3,760,797
Atlantic City	May	168	58,134	36,612	102,796	18,177	14,901	2,338	96,611	3,970	136,076	132.4	—33,280	—66,711	—74,778	—79,111
	5 mos.	168	321,070	166,862	526,821	100,720	70,262	9,762	503,316	21,362	706,045	134.0	—179,224	—364,379	—411,566	—435,689
Richmond, Fredericksburg & Potomac	May	117	358,140	84,371	551,831	68,907	94,399	8,172	201,675	29,414	410,861	74.5	140,970	109,750	65,821	43,734
	5 mos.	117	1,560,453	657,751	2,775,090	263,649	478,103	40,309	1,062,696	149,863	2,042,713	73.6	732,377	578,564	314,593	331,231
Rutland	May	413	213,200	22,129	304,298	45,342	54,635	10,964	131,267	13,296	255,504	84.0	48,794	28,835	39,041	36,926
	5 mos.	413	824,988	151,957	1,303,768	197,055	280,278	50,481	620,983	67,530	1,215,469	93.2	88,299	—11,202	42,908	130,504
St. Louis-San Francisco	May	5,266	2,926,533	163,772	3,393,916	571,965	725,685	92,165	1,073,998	141,792	2,615,619	77.07	778,297	470,469	420,062	322,377
	5 mos.	5,266	12,797,918	839,180	14,911,412	2,473,537	3,632,394	447,480	5,325,321	698,744	12,579,251	84.36	2,332,161	710,621	447,764	1,243,371
Ft. Worth & Rio Grande	May	233	31,129	986	37,626	14,511	11,957	2,311	27,747	3,434	59,913	159.2	—22,287	—26,308	—33,788	—32,774
	5 mos.	233	134,049	5,154	163,842	82,814	57,527	11,728	112,735	17,852	282,419	172.4	—118,577	—138,714	—173,599	—186,035
St. Louis, San Francisco & Texas	May	262	81,496	1,097	86,157	20,980	18,392	5,176	33,894	7,244	85,677	99.4	480	—3,493	—31,939	—31,445
	5 mos.	262	361,774	3,134	381,009	116,396	86,262	24,299	166,505	36,286	428,850	112.6	—47,841	—67,808	—199,612	—246,271
St. Louis Southwestern Lines	May	1,884	1,128,205	16,174	1,197,372	115,722	132,721	68,900	349,509	63,052	734,972	61.4	462,400	381,021	273,121	4,985
	5 mos.	1,908	4,620,843	65,935	4,919,053	561,473	710,248	346,312	1,689,480	332,894	3,662,815	74.5	1,256,238	884,874	373,789	28,251
San Diego & Arizona Eastern	May	155	34,644	2,557	40,130	9,127	7,462	1,831	15,638	4,705	39,374	98.1	756	—2,498	—889	—35,509
	5 mos.	155	171,688	26,138	206,477	46,082	43,468	9,303	86,955	23,190	211,842	102.6	—5,365	—21,751	—17,544	—82,582
Seaboard Air Line	May	4,385	2,311,469	157,161	2,752,183	421,820	532,310	130,561	967,161	131,440	2,205,440	80.1	546,743	306,560	251,928	2,781
	5 mos.	4,385	11,942,568	1,080,841	14,414,925	2,117,729	2,714,337	666,206	5,001,048	648,072	11,284,691	78.3	3,130,234	1,967,040	1,351,568	855,077
Southern Ry.	May	6,653	5,411,163	537,655	6,544,085	770,145	1,122,639	163,339	2,258,895	264,796	4,611,232	70.5	1,932,853	1,459,737	1,310,353	—207,444
	5 mos.	6,653	24,801,425	2,579,472	29,962,921	3,360,290	5,798,639	774,403	10,972,546	1,246,364	22,242,045	74.2	7,720,876	5,271,177	4,537,683	983,834
Alabama Great Southern	May	315	331,265	33,523	401,239	54,603	83,139	9,760	128,492	13,953	291,736	72.7	109,503	74,815	73,193	—51,817
	5 mos.	315	1,338,638	141,940	1,625,440	261,569	403,854	47,862	592,836	70,784	1,386,068	85.3	239,372	65,941	23,949	—225,453
Cinn., New Orleans & Tex. Pac.	May	336	958,173	36,822	1,061,522	104,386	164,562	22,863	255,440	38,089	588,685	55.5	472,837	388,046	351,174	152,783
	5 mos.	337	3,868,674	233,776	4,371,168	493,471	876,012	111,350	1,161,757	182,762	2,843,635	65.1	1,527,533	1,202,421	1,126,801	623,767

Continued on next left-hand page





Prevention Less Expensive Than The Cure

THERE is no locomotive ailment more contagious and more destructive than *pounds*.

Prevention of the causes is the first consideration.

Apply HUNT-SPILLER *AIR FURNACE* GUN IRON Crosshead Shoes, Hub Liners, Outer Rod Bushings and Pedestal Shoes and Wedges to resist the attack of frictional wear and dynamic thrusts.

Their wear-resisting qualities are helping many railroads to reduce running repairs, frequent adjustments and prevent those disastrous pounds which literally tear a locomotive to pieces.

HSGI
Reg. U. S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings

Parts Finished For Application

Dunbar Sectional Type Packing
Duplex Sectional Type Packing for Cylinders and Valves
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER MFG. CORPORATION
J. G. Platt, Pres. & Gen. Mgr. V. W. Ellet, Vice-President.

Office & Works
383 Dorchester Ave. South Boston, 27, Mass.

Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER GUN IRON

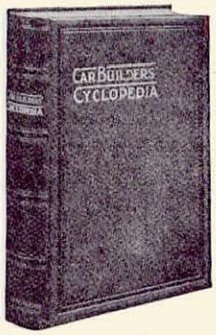
Air Furnace

Revenues and Expenses of Railways

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Georgia Southern & Florida	May	397	$114,074	$15,439	$148,855	$26,363	$33,683	$2,283	$69,014	$2,180	$135,142	90.8	$13,713	—$1,387	—$15,131	$13,355
	5 mos.	397	493,913	107,336	691,868	118,298	165,312	9,586	241,342	11,401	557,075	80.5	134,793	59,112	27,487	40,685
New Orleans & Northeastern	May	204	139,002	13,239	164,694	30,901	37,846	5,226	59,145	8,433	142,768	86.7	21,926	—8,782	—29,053	—55,305
	5 mos.	204	561,196	64,661	682,839	122,255	190,313	26,269	288,048	42,040	675,176	98.9	7,663	—146,085	—219,049	—189,479
Northern Alabama	May	99	43,988	1,674	47,325	9,966	1,414	1,088	14,011	1,706	28,185	59.6	19,140	14,612	19	—20,628
	5 mos.	99	193,827	5,306	206,408	43,873	6,224	5,737	68,620	8,669	133,121	64.5	73,287	50,852	—23,234	—45,168
Southern Pacific	May	9,082	6,040,916	1,204,648	8,081,444	705,840	1,425,904	279,589	2,892,965	548,740	5,997,716	74.2	2,083,728	1,108,142	760,165	656,057
	5 mos.	9,095	25,063,194	5,701,935	34,205,750	3,706,763	6,798,801	1,303,505	13,771,182	2,751,798	29,053,505	84.9	5,152,245	291,207	—1,031,268	1,048,343
So. Pac. Steamship Lines	May	....	344,603	9,712	383,550	14,760	99,430	16,220	273,158	20,384	423,952	110.5	—40,402	—41,189	—41,321	—70,017
	5 mos.	....	1,430,100	46,904	1,555,509	68,206	505,084	79,279	1,186,615	103,700	1,942,884	124.9	—387,375	—395,009	—395,641	—512,141
Texas & New Orleans	May	4,488	2,145,442	193,274	2,651,383	321,362	484,859	112,690	858,160	223,165	2,015,028	76.0	636,355	443,677	260,610	6,671
	5 mos.	4,533	9,025,384	909,365	11,266,036	1,685,578	2,356,821	571,497	4,198,700	1,088,396	9,954,772	88.4	1,311,264	164,171	—765,489	—858,737
Spokane, Portland & Seattle	May	552	335,704	30,748	404,794	35,731	37,889	5,570	128,913	17,586	226,226	55.9	178,568	101,934	90,987	39,602
	5 mos.	552	1,237,400	105,499	1,522,244	161,413	225,504	30,714	593,026	90,530	1,105,058	72.6	417,186	33,294	2,392	12,192
Tennessee Central	May	287	132,137	3,241	143,171	28,901	25,306	4,895	49,557	10,164	118,780	83.0	24,391	22,009	8,526	3,731
	5 mos.	292	701,673	16,315	761,372	133,158	116,499	25,102	267,361	51,197	593,130	77.9	168,242	154,348	77,100	60,691
Term. R. R. Assn. of St. Louis	May	55	.....	.....	531,164	28,286	26,268	3,088	208,799	15,630	284,214	53.5	246,950	167,621	235,587	94,913
	5 mos.	55	.....	.....	2,336,864	184,266	133,565	15,843	1,043,790	82,590	1,471,412	63.0	865,452	445,157	762,337	517,329
Texas & Pacific	May	1,950	1,465,765	125,191	1,782,952	173,780	312,301	59,818	537,516	102,220	1,199,757	67.3	583,195	481,891	349,518	181,340
	5 mos.	1,950	6,326,340	654,189	7,883,165	826,410	1,472,728	301,223	2,571,795	522,380	5,765,077	73.1	2,118,088	1,607,978	1,023,918	1,005,134
Texas Mexican	May	162	63,356	655	68,456	8,482	11,992	3,111	28,533	6,867	58,985	86.2	9,471	4,875	987	28,129
	5 mos.	162	249,575	3,010	275,924	46,247	61,813	14,623	128,287	33,349	282,512	102.4	—6,588	—29,587	—44,814	42,120
Toledo, Peoria & Western	May	239	150,991	34	152,831	43,063	10,379	13,916	36,004	7,544	110,906	72.6	41,925	36,618	23,451	5,708
	5 mos.	239	587,464	140	595,791	142,245	49,124	67,898	169,601	37,293	466,161	78.2	129,630	111,130	61,691	26,304
Toledo Terminal	May	28	.....	.....	62,780	5,579	7,827	436	25,809	3,882	43,533	69.3	19,247	12,224	26,130	5,414
	5 mos.	28	.....	.....	300,258	21,297	42,514	2,262	140,928	20,655	227,655	75.8	72,603	34,946	96,035	84,233
Union R. R. of Penna	May	45	.....	.....	166,025	50,102	94,522	104	74,809	13,441	232,978	140.3	—66,953	—74,564	—52,048	—98,794
	5 mos.	45	.....	.....	632,535	137,828	437,021	592	358,083	69,762	1,003,286	158.6	—370,751	—404,416	—334,996	—323,161
Union Pacific	May	3,768	4,479,344	403,366	5,351,188	476,206	970,151	114,081	1,443,513	260,294	3,315,200	62.0	2,035,988	1,565,492	1,360,255	759,243
	5 mos.	3,767	17,354,326	1,615,214	21,016,859	1,556,909	4,543,146	526,539	6,889,947	1,344,853	15,107,533	71.9	5,909,326	4,156,773	3,418,440	3,850,139
Oregon Short Line	May	2,504	1,296,125	88,445	1,499,863	228,028	200,113	31,919	472,334	88,793	1,033,578	68.9	466,285	196,152	128,034	—55,971
	5 mos.	2,504	6,002,482	409,928	7,008,904	791,615	1,065,121	161,294	2,476,924	444,666	5,075,130	72.4	1,933,774	701,075	313,809	484,957
Oregon-Wash. R. R. & Nav. Co.	May	2,316	894,423	85,397	1,115,874	201,576	137,465	48,282	414,561	82,700	888,583	79.6	227,291	89,251	—15,200	—214,183
	5 mos.	2,316	3,657,055	327,833	4,528,106	745,887	696,530	236,463	2,050,895	425,869	4,175,980	92.2	352,126	—299,054	—791,893	—924,657
Los Angeles & Salt Lake	May	1,248	902,644	114,350	1,120,438	172,302	153,554	44,801	328,925	58,453	780,543	69.7	339,895	217,559	103,495	88,233
	5 mos.	1,249	4,334,820	464,552	5,218,789	681,637	835,689	214,053	1,716,630	290,840	3,847,112	73.7	1,371,677	800,550	196,193	445,261
St. Joseph & Grand Island	May	258	212,382	2,355	222,916	33,698	23,357	2,117	59,894	11,004	130,470	58.5	92,446	82,130	61,743	28,014
	5 mos.	258	863,244	8,125	907,120	97,308	145,175	11,261	291,551	58,896	604,791	66.7	302,329	250,770	152,128	157,642
Utah	May	111	55,257	.....	55,357	10,984	17,578	441	12,816	5,183	47,002	84.9	8,355	2,825	—6,261	—12,681
	5 mos.	111	470,211	.....	473,109	53,852	110,597	2,386	102,449	25,175	294,459	62.2	178,650	132,449	72,053	65,764
Virginian	May	608	931,172	3,558	970,538	95,370	196,614	15,683	188,929	27,342	522,943	53.9	447,595	322,595	378,949	277,752
	5 mos.	608	4,944,545	22,431	5,181,420	508,893	978,090	80,037	998,679	145,362	2,708,958	52.3	2,472,462	1,787,462	2,112,577	2,156,585
Wabash	May	2,480	2,787,011	135,867	3,171,839	413,215	490,724	129,554	1,204,122	123,698	2,367,523	74.6	804,316	635,131	311,388	70,258
	5 mos.	2,480	12,059,895	711,902	13,800,366	1,776,249	2,422,322	664,932	5,882,100	650,172	11,430,101	82.8	2,370,265	1,419,873	—243,524	—505,436
Ann Arbor	May	293	217,506	1,542	225,829	26,422	45,241	10,215	98,629	9,755	190,304	84.3	35,525	23,498	4,278	—9,095
	5 mos.	293	1,059,912	8,217	1,100,503	122,931	214,698	54,829	511,388	50,154	954,139	86.7	146,364	65,649	—23,091	25,183
Western Maryland	May	891	858,528	6,395	894,764	117,791	141,822	31,758	235,630	37,246	564,974	63.1	329,790	259,790	279,581	265,548
	5 mos.	891	4,313,516	27,922	4,476,270	513,532	776,653	157,289	1,204,623	174,387	2,839,852	63.4	1,636,418	1,286,418	1,320,672	1,452,465
Western Pacific	May	1,210	847,878	18,717	900,589	164,395	154,330	55,458	334,290	34,324	761,934	84.6	138,655	59,535	37,323	—9,642
	5 mos.	1,210	3,270,748	65,683	3,466,827	554,552	748,963	272,428	1,514,176	175,539	3,332,280	96.1	134,547	—259,039	—273,651	—433,810
Wheeling & Lake Erie	May	511	853,243	1,294	894,783	97,831	225,662	25,920	235,190	25,154	609,693	68.1	285,090	205,559	187,186	—104,736
	5 mos.	511	3,289,758	7,452	3,482,538	349,871	998,390	130,815	1,066,491	127,592	2,673,093	76.8	809,445	433,540	327,142	—38,929
Wichita Falls & Southern	May	203	44,419	20	45,906	8,875	6,520	1,810	13,175	3,388	33,768	73.56	12,138	8,928	5,258	—3,857
	5 mos.	203	201,932	130	209,556	42,949	33,999	8,350	62,077	15,441	162,816	77.70	46,740	32,699	16,221	12,158

Research Results for Mechanical Men



Car Builders' Cyclopedia

of American Practice

Edited by Roy V. Wright

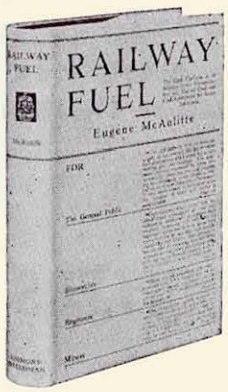
Editor of "Railway Mechanical Engineer"

Prepared under the auspices of the Mechanical Division of the American Railway Association this book is indispensable to car shop superintendents, master car builders, general foremen and others in charge of the construction and repair of rolling stock. The Thirteenth Edition contains new equipment, standard specifications, recommended practices, scale drawings, illustrations, and technical data regarding all kinds of manufactured products used in car work.

SECTIONS

Dictionary of Terms—Freight Equipment Cars—Freight Car Construction Details—Railway Service Cars—Passenger Equipment Cars—Rail Motor Cars—Passenger Car Construction and Equipment—Passenger Train Lighting—Passenger Train Heating—Ventilation and Air Conditioning—Car Trucks, Lubrication and Roller Bearings—Draft Gears, Couplers and Buffers—Air Brakes and Signals—Brake Gears—Safety Appliances—Shops and Car Maintenance—Car Inspection, Interchange, Loading—Car Materials—Industrial and Mine Cars—Foreign Cars—Indexes.

1931. 1260 pages, 3,400 illustrations, including fold-in charts, 9 x 12 x 3 inches. Buckram binding, $5.00; leather binding, $7.00



Now Only $4.00

Railway Fuel

By Eugene McAuliffe

President, Union Pacific Coal Company; Organizer of the International Railway Fuel Association

The story of the coal industry in its relationship to the railroads, written by a man widely regarded as the leading authority on the subject. Fuel oil is also discussed. The text is supplemented by many illustrations, statistical charts and tables of pertinent information.

CHAPTER HEADINGS

The Magnitude of the Railway Fuel Problem—Classification of Coals—Coal Analysis—Our Coal Resources—Coal Storage—The Relation of Coal to Railway Ton-Miles—The Coal Mining Industry—Coal Mining Methods—Coal Mining Machinery—Mines and Man Power—Coal Car Distribution—Purchase and Inspection of Coal—Present and Future Use of Fuel Oil—American Petroleum Institute-Report of Committee of Eleven—The Federal Oil Conservation Board—Railroad Use of Fuel Oil—Fuel Conservation—Fuel Performance—Road Losses—Locomotive Appliances—Trends in Locomotive Design—Progress in Locomotive Utilization—Fuel Conservation in the Roundhouse—Water for Locomotives-Its Relation to Fuel—The Use of Powdered Fuel—Miscellaneous Fuel Consumption—A Central Research Bureau.

1927. 480 pages, 86 illustrations, 23 statistical appendices, index, 6 x 9 inches, cloth. $4.00

Locomotive and Boiler Inspector's Handbook

By A. J. O'NEIL

Locomotive Inspector, Public Service Commission and Transit Commission for the State of New York

Furnishes all the information necessary to pass an examination for the position of locomotive or boiler inspector. One hundred and sixty-two questions are given which might well form the basis of the examination for inspectors. All Federal laws, rules and requirements of the Interstate Commerce Commission are included.

The second edition contains many new illustrations and 12 pages of new material, including an insert of 1929 rules and amendments. It is in flexible binding so that it can be slipped into the pocket of a work jacket and carried on the job.

CONTENTS

Locomotive Boiler Inspection Law—Rules and Regulations for the Inspection of Locomotive Boilers—Rules and Interpretations for the Inspection of Steam Locomotives and Tenders (Rules 101 to 143)—Rules and Interpretations for the Inspection of Steam Locomotives and Tenders (Rules 144 to 162)—Locomotive Safety Appliance Standards—Inspection Reports—Inspector's Explanation Questions and Answers—Welding—Specifications for Boiler Materials—Types of Longitudinal Joints and Patches—Locomotive Appurtenances—Miscellaneous Tables.

1929. Second edition. 297 pages, 140 illustrations, 5 x 8 inches, flexible binding. $2.50

FREE EXAMINATION COUPON

Simmons-Boardman Publishing Company
30 Church Street, New York, N. Y.

Send me on 10 days' Free Examination, the book or books checked below. I will either remit the list price or return the book within that time.

( ) Car Builders' Cyclopedia ( ) Railway Fuel
( ) Locomotive and Boiler Inspector's Handbook

Name .....

Address .....

City ..... State .....

Company ..... Position .....

(Books sent on approval to retail purchasers in the U. S. and and Canada only) RA 7-8-33

MAGNUS COMPANY

(INCORPORATED)

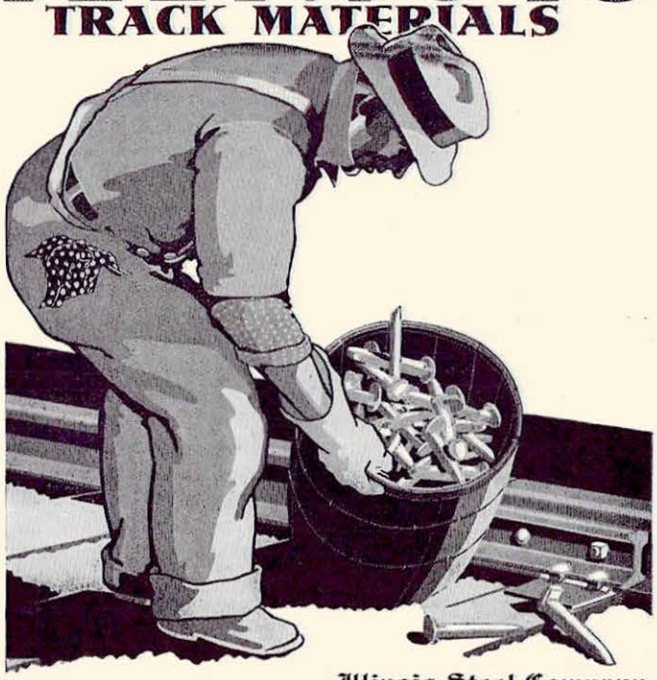
Journal Bearings

AND

Bronze Engine Castings

New York Chicago

ILLINOIS
TRACK MATERIALS



Illinois Steel Company
SUBSIDIARY OF UNITED STATES STEEL CORPORATION
208 South La Salle Street, Chicago, Illinois

Uniform Quality assures long service

Spikes · Bolts · Angle Bars · Tie Plates

A. R. A.
STANDARD COUPLERS

Including

SWIVEL COUPLERS

With

SWIVEL BUTTS

Or

SWIVEL YOKES

Pitt Passenger Couplers

STEEL CASTINGS

McConway & Torley Corporation
Pittsburgh, Pa.

CAMEL Freight Car Door Fixtures
YOUNGSTOWN Corrugated Steel Freight Car Doors
CAMEL SALES COMPANY 332 South Michigan Avenue CHICAGO, ILLINOIS

BARBER LATERAL - MOTION DEVICE
1,300,000 cars equipped
ROLLER SIDE-BEARINGS
STANDARD CAR TRUCK CO.
McCORMICK BUILDING CHICAGO

WINE RAILWAY APPLIANCE CO.
TOLEDO, OHIO
Details of our products appear in following issues of Railway Age during 1932
January 16—March 19—May 21—August 13—September 17—November 19—or Railway Mechanical Engineer.

For Complete Alphabetical Index to Advertisers see page 18

EDGEWATER STEEL COMPANY
PITTSBURGH, PA.
Details of our products appeared in the following issues of Railway Age during 1931, 1932 & 1933:
1931—May 16—June 13—July 4—Aug. 1, 8, 15, 22, 29—Sept. 5, 12—Oct. 3—Dec. 5.
1932—Jan. 2—March 5—April 2—May 7—June 18, 25—Sept. 3.
1933—Feb'y 4, 25—March 4—April 1.

PROFESSIONAL DIRECTORY

Your name should appear before the readers of this publication.

Your professional card should appear in this section

Robert W. Hunt Company
ENGINEERS
Inspection—Tests—Consultation
All Railway Equipment, Structures and Materials
General Office:
175 W. Jackson Boulevard
CHICAGO
Offices in all principal cities

GET TOGETHER DEPARTMENT

Non-Display "Employment" Ads five cents a word. Count address in figuring cost. Box number requires ten words. All other classified Ads $4.00 an inch (1" x 1⅝") an insertion. Payable in advance. Railway Age, 30 Church St., New York, N. Y.

Your classified advertisement should appear in this section.

POSITION OPEN

IF YOU are open to overtures for new connection, and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established twenty-three years. Send only name and address for details. R. W. Bixby, Inc., 102 Delward Building, Buffalo, New York.

EDUCATIONAL

THE Railway Educational Bureau, Omaha, Neb., offers a distinctive education service for Supervisors and other employes. Write for FREE Special Bulletin

Index to Advertisers

July 8, 1933

A

Adanac Supplies, Ltd. ..... Front Cover
American Arch Co., Inc. 11
American Locomotive Co. 12
American Steel Foundries ..... Front Cover, 3

B

Baldwin Locomotive Works, The 2
Bethlehem Steel Company 4
Bettendorf Company, The ..... Front Cover
Birdsboro Steel Foundry & Machine Co. ..... Front Cover
Bixby Inc., R. W. 17
Buckeye Steel Castings Co. ..... Front Cover

C

Camel Sales Company 17
Classified Advertisements 17

E

Edgewater Steel Co. 17

F

Franklin Railway Supply Co., Inc. 10

G

Get Together Department 17
Gould Coupler Co., The ..... Front Cover

H

Harbison-Walker Refractories Co. 11
Hunt Company, Robert W. 17
Hunt-Spiller Manufacturing Corp. 14
Hutchins Car Roofing Co. 8

I

Illinois Steel Company 16

K

Kerite Insulated Wire & Cable Co., Inc., The 16

L

Lima Locomotive Works, Inc. 9

Mc

McConway & Torley Corp. 16

M

Magnus Company, Inc. 16

O

Ohio Steel Foundry Co., The ..... Front Cover

P

Pittsburgh Steel Foundry Corp. ..... Front Cover
Professional Directory 17

R

Railway Educational Bureau, The 17
Republic Steel Corp. 13

S

Scullin Steel Co. ..... Front Cover
Simmons-Boardman Publishing Co. 15
Standard Car Truck Co. 17
Symington Company, The ..... Front Cover

U

Union Switch & Signal Co. 6, 7

W

Westinghouse Air Brake Co. 19
Westinghouse Electric & Manufacturing Co. 20
Wine Railway Appliance Co. 17

The NEW "AB" FREIGHT BRAKE

HAS IMPROVED FLEXIBILITY FOR GRADE OPERATION

THE improved quick service feature of this equipment, which assures such an effective and efficient brake throughout long trains in level service, is automatically modified to conform with the best operating conditions for grade service . . . The cylinder pressure resulting from the substantial brake pipe reduction that hastens serial action is limited to a definite amount so that when a re-application is made with retainers in holding position, quick service activity does not add cylinder pressure, but merely hastens serial action . . . This increases the flexibility of control while cycling on descending grades without liability of stalling the train or running at excessive speeds, thus assuring safe and smooth control of greater tonnage trains with more uniform distribution of wheel temperature and brake shoe wear.

This Advertisement is No. 6 of a Series.

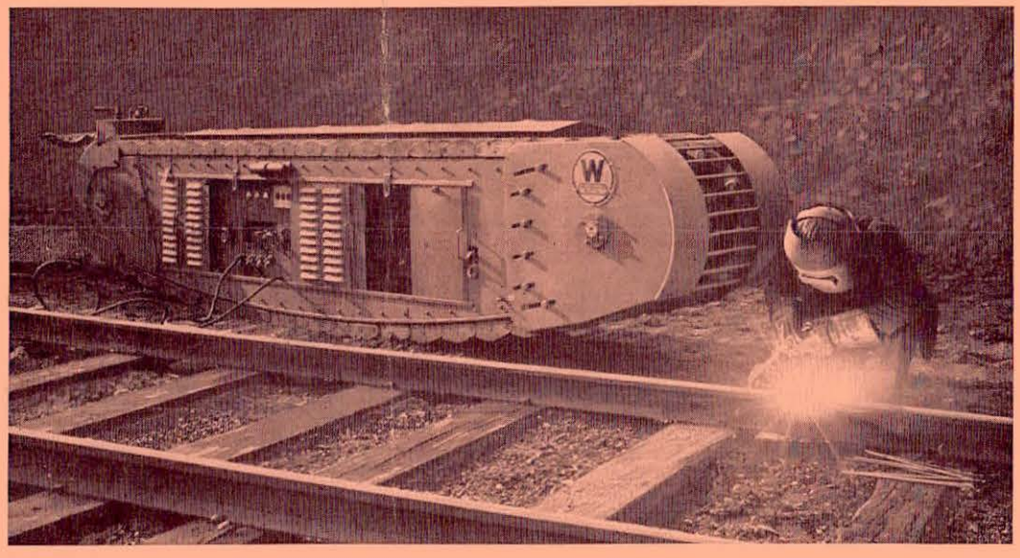
WESTINGHOUSE AIR BRAKE CO.

General Office and Works, Wilmerding, Penna.

1240

● RAILROAD-DEVELOPED

● WESTINGHOUSE-BUILT



New Westinghouse Tractor Welder for maintenance of way work—furnishes power for Welding, for operating electric tools and for lights.

This TRACTOR WELDER *saves your maintenance Dollars*

One of a series of advertisements featuring self-liquidating modern improvements that many railroads are applying to reduce costs in shops, maintenance of way, and signaling operations.

FOR the first time! A tractor-mounted power and welding unit designed especially for track, bridge, and structure maintenance.

This new machine furnishes ample power for simultaneous welding and operation of electric tools such as grinders, slotters, drills and nut tighteners.

Long, expensive welding cables are unnecessary. Its small size permits operation along the track shoulder clear of traffic. It can pivot, cross tracks, climb steep slopes and reach positions inaccessible to other types of equipment.

Six of these tractor welders are now in operation on the Lehigh Valley Railroad.

Westinghouse is prepared to furnish portable or stationary welding and power units with *any* type of mounting desired.

A Westinghouse engineer will be glad to bring you complete information . . . or simply mail the coupon.

SEND FOR INFORMATION

Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.

Gentlemen: Your information on Tractor Welders, please.

Name .....
Company .....
Position ..... T 79612
Address ..... RA 7-8-33

Westinghouse

Quality workmanship guarantees every Westinghouse product